



State Title V Block Grant Narrative

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Sections 5.4 – 5.7, containing standard forms and detailed descriptions of national and State performance and outcome measures, are not included in this PDF. Data from these sections can be viewed in interactive formats on the Title V Information System Web site (<http://www.mchdata.net>).

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COLORADO

**MATERNAL AND CHILD HEALTH
BLOCK GRANT PROGRAM**

APPLICATION FOR FY 2001

including the

Five-Year Needs Assessment



**Colorado Department
of Public Health
and Environment**

Submitted July 15, 2000

by the

Family and Community Health Services Division
Colorado Department of Public Health & Environment, FCHSD-ADM-A4
4300 Cherry Creek Drive South, Denver, CO 80246

July 10, 2000

July 10, 2000

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To Whom It May Concern:

Enclosed is one copy of Colorado's Maternal and Child Health Application for FY 01, and two disks which contain the text and the exported tables. Because of technical problems, we were unable to put one of our organizational charts and a Health Provider Shortage Area map on the disks. Extra copies of the affected pages are included for your use.

We look forward to our meeting on August 17, 2000 with the Region VIII Office.

Sincerely,

Merril Stern, Director
Family and Community Health Services Division

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Enclosures

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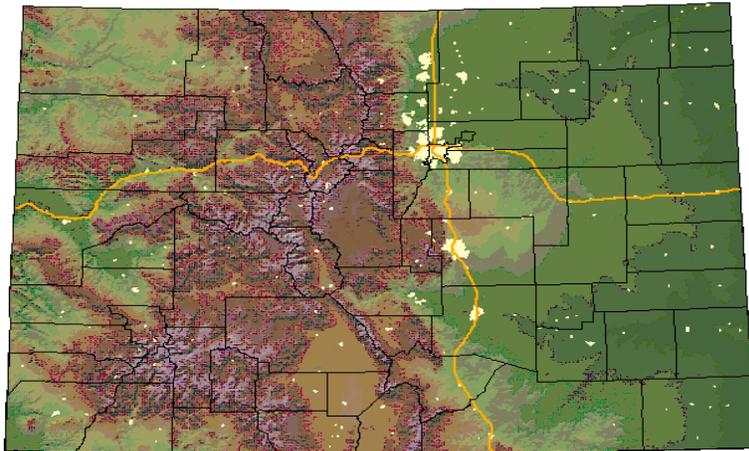
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Colorado Maternal and Child Health Block Grant Application FY 01

1.4 Overview of the State

Colorado is the seventh largest state in the continental United States and covers approximately 103,600 square miles. Large mountains divide the state into eastern and western halves and serve as the origin for five major U.S. rivers. The western half of Colorado, a thinly populated area known as the Western Slope, is mountainous, with 54 peaks rising over 14,000 feet. The eastern half, thinly populated as well, is covered by flat plains that support farming and grazing. In the middle of the state, spread north and south along the eastern side of the Rocky Mountains, is an increasingly populated zone known as the Front Range, which contains most of the state's residents and economic activity. In the southern third of the state, by contrast, lies an area of small populations, poverty and a lower level of economic activity.



The mountains, while very beautiful and the major reason for Colorado's strong tourist industry, present a massive physical barrier to the provision of health care across the state. The rural vastness of much of the state, furthermore, is confirmed by 31 of Colorado's 63 counties qualifying as "frontier counties," containing fewer than 6 persons per square mile. Nonetheless, the population of Colorado in the year 2000 is estimated at 4,217,000, an increase of nearly one million since the 1990 Census, when 3,294,394 people were enumerated. The growth in the past decade, and particularly the growth since 1995, has been rapid and unprecedented in its size. The number of births in the state has increased from 53,491 in 1990 to an estimated 66,000 annually. The strong Colorado economy, with its exceptionally tight labor force, has encouraged migration to the state to fill jobs in the construction, service, and high technology industries, and to add to the population in metropolitan and resort areas. The migration of young Hispanic workers and

their families has been especially noticeable. In 1990, 9,131 births were to Hispanics; in 1998 the number had increased 57 percent to 14,364. Migration is evident in many of the western counties of the state, which have experienced a large influx of population. Many small counties have experienced growth that has also severely strained housing availability. And migration has been particularly strong in the Front Range area.

In January 2000, the state's unemployment rate reached a record low of 2.6 percent, down from 3.8 percent the previous year, and the lowest ever in a series that dates back 22 years. The improvements in the state's economy have been accompanied by decreases in poverty statewide. The U.S. Census Bureau estimated an overall poverty level of 10.5 percent in 1996, compared to 11.7 percent found in 1990. Declines have also occurred in the poverty level found among children. According to the 1990 Census, 15.3 percent of children under 18 were below 100 percent of the federal poverty line; the most recent estimate for all children is estimated at 14.6 percent (1996). This level suggests that there are 179,600 children living below the poverty line in Colorado, as well as 100,100 women of childbearing age who also fall in this category.

The health needs of Colorado's women and children must be viewed in this context: a vibrant state economy that nevertheless does not address the needs of all its residents. There are glaring disparities in the health status of different populations. These are easily noted when making racial/ethnic comparisons of different indicators of access to care, such as first trimester prenatal care, or unintended pregnancy. The racial/ethnic groupings are closely tied to socioeconomic status, which is not captured from vital statistics data. There are also disparities in different geographic areas of the state, some related to the poverty of the populations (e.g. in the south) and some related to the long distances to metropolitan areas with appropriate services (e.g. in the northwest). A discussion of disparities is included in the Needs Assessment section.

In 1998, the Title V program of the Colorado Department of Public Health & Environment determined ten priority areas for its maternal and child health efforts. These areas have great impact on the health of women and children in the state. If addressed appropriately, the health of women and children will be improved; if ignored, their health will be compromised. It is the task of the state agency to highlight these areas, provide information, data, and interpretation of the issues, suggest systemic ways to address the issues, and ensure implementation of logical means for improvement.

The Colorado Department of Public Health and Environment's strategic plan, "Challenges and Opportunities for a New Century," was published in September 1999 and focuses on a number of areas related to the health of women and children. Prevention is considered to be a critical investment area, particularly in the area of lifestyle behaviors, including tobacco use among teens. Immunizations for children are considered a key investment, as well as unintentional and intentional injury reduction, especially deaths due to suicides among adolescents. Addressing disparities in health status among groups most at risk is also considered important. The reduction of infant mortality among black infants relative to white is singled out as another critical marker. Education of state residents is considered an important strategy to improving health among Coloradans.

The ten priority areas for maternal and child health are consistent with the department's strategic plan. They are listed below, and it is clear that virtually all fall under the heading of prevention. The priority area number is for labeling purposes only; the priorities are not in order of importance.

Prevention

Reducing teen pregnancy and unintended pregnancy in women of all ages.
Reducing child and adolescent morbidity
Increasing health and safety in child care settings
Reducing unintentional and intentional injury
Increasing access to health care (including behavioral health care)
Improving state and local infrastructure by increasing capacity to analyze data, carry out evaluations, develop quality standards, etc.
Reduce substance abuse (alcohol, tobacco, and drugs)
Improving oral health and access to oral health care

Immunizations

Improving immunization rates for all children

Infant Mortality

Improving perinatal outcomes.

Title V resources are directed toward these ten priority areas, although the primary responsibility for immunizations falls in the Division of Disease Control and Environmental Epidemiology. Access to care issues are addressed by the Family and Community Health Services Division, and Colorado's Child Health Insurance Program, Child Health Plan Plus, is a new source of insurance for many low-income children.

It should be noted that major public health efforts that require additional funding in the state are faced with restrictions on state government spending. While state revenues have increased in keeping with the strong economy, spending authority has been constrained by a state constitutional amendment known as TABOR, added in 1992. The amendment allows expenditures to increase from year to year only by the amount of inflation plus the amount of population growth. State revenues have increased far in excess of this percentage, but the money cannot be spent. New investment in state infrastructure or programs, therefore, is severely limited.

1.5 The State Title V Agency

The Family and Community Health Services Division within the Colorado Department of Public Health & Environment is charged with the promotion and protection of the health of all mothers and children in the state. The vision of the Division includes "a future with communities that value and promote health and assure access to health care services; families who provide a safe,

supportive environment for optimal well-being; and individuals who have the knowledge, support, and motivation to be as healthy as possible.” (See Section 5.3, Other Supporting Documents, for a complete statement of the Division mission, values, and goals.)

1.5.1 State Agency Capacity

1.5.1.1 Organizational Structure

The Colorado Department of Public Health and Environment is one of sixteen Colorado state agencies and is located in Denver, the capital of the state. The organizational chart for the entire Department is provided on the following page and the organizational chart for the Family and Community Health Services Division, responsible for all maternal and child health block activities, is on the next page.¹ The Family and Community Health Services Division is one of four divisions which come under the authority of Dr. Richard Hoffman, the Chief Medical Officer of the State. Dr. Hoffman is responsible to Ms. Jane Norton, the Executive Director of the Department, and Ms. Norton reports to Governor Bill Owens.

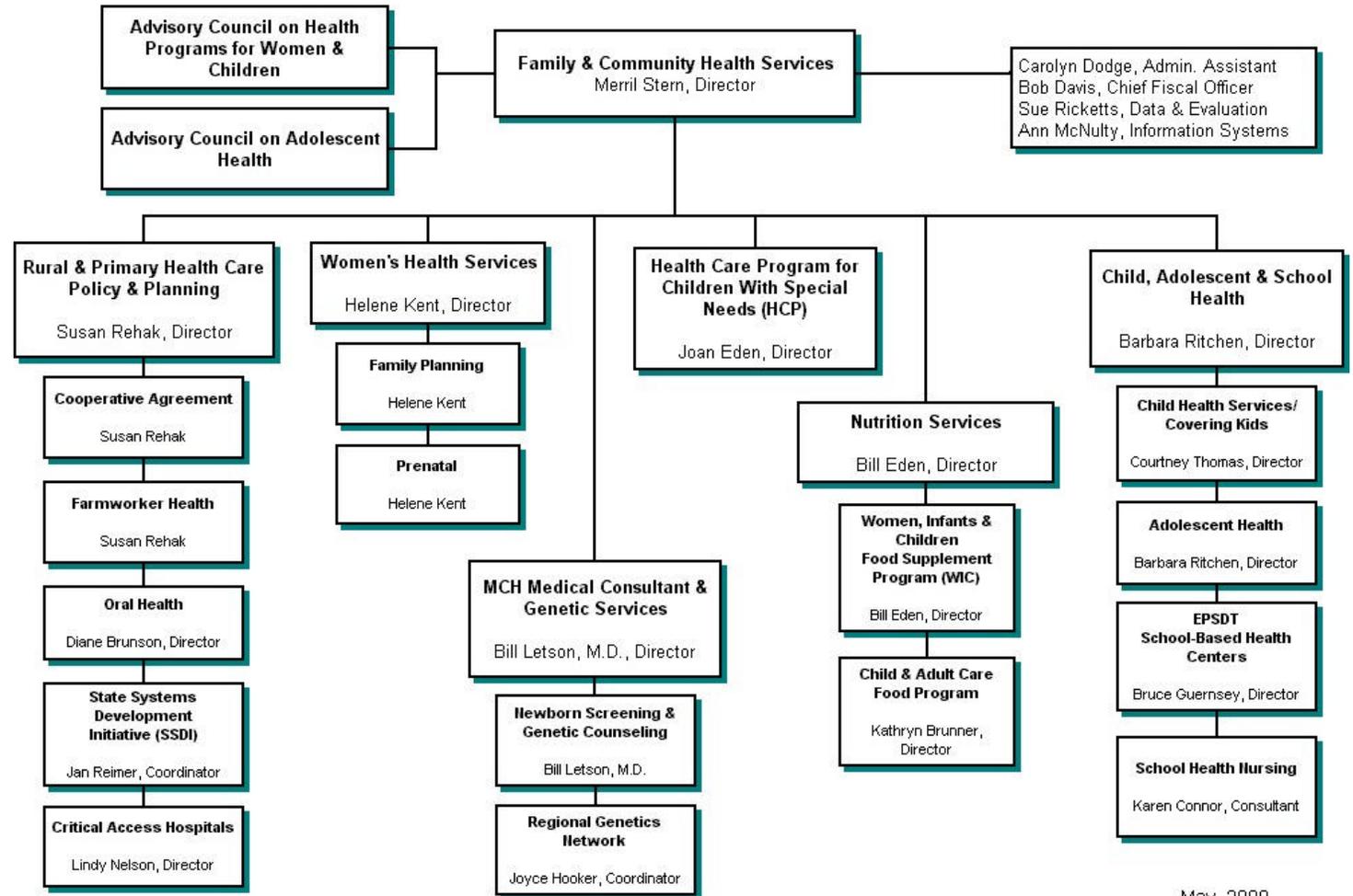
The Family and Community Health Services Division Title V-funded programs are organized into the following areas:

- Rural & Primary Health Care Policy and Planning, which includes the State Systems Development Initiative and the Oral Health Program;
- Women’s Health Services, which includes the Prenatal and Prenatal Plus Programs;
- MCH Medical Consultant & Genetic Services, which includes Newborn Screening;
- Health Care Program for Children with Special Needs, which includes the Development & Evaluation Clinical Program, and the Newborn Hearing Screening Program, and
- Child, Adolescent & School Health, which includes Child Health Services/EPSTD, Adolescent Health, School-Based Health Centers, and School Health Nursing.

In addition, Title V funds the Public Health Nursing section, located in the newly established Office of Local Liaison. The section provides technical consultation to local nursing services and organized health departments. The section moved out of the Family and

¹ The Health Department chart is not available in the electronic version of the grant. It can be found at <http://10.1.0.25/orgchart.pdf>. The Division chart may appear to be unclear in the electronic version of this grant application due to software incompatibilities.

Organizational Chart
Family and Community Health Services Division
 Colorado Department of Public Health & Environment



May, 2000

Community Health Services Division in February 2000 and now reports directly to Jane Norton.

A few additional Family and Community Health Services Division programs, shown on the organizational chart, operate with funds largely from outside Title V: Nutrition Services, which includes the Child and Adult Care Food Program and the WIC Program, and the Family Planning Program in Women's Health Services.

State Statutes Relevant to Title V Programs

The state of Colorado does not have a statute related specifically to maternal and child health. Under the Colorado Revised Statutes 1973, SECTION 1, 25-1-709, however, it is stated that regional health departments “shall include to the greatest extent possible, but not be limited to: (a) Personal health services, including: Communicable disease control; tuberculosis control; . . . maternal and child health services. . . .” The Colorado Department of Public Health and Environment has always carried out its MCH activities under Titles 25 and 31, Colorado Revised Statutes 1973, the general statutory authority for the operation of the Department.

About fifteen years ago a question arose about statutory authority to operate a program for children with special health care needs. Subsequently, an amendment was enacted into the general statutes which gives the Department specific authority to operate such a program. This statute reads as follows:

**CONCERNING AUTHORIZATION FOR A HANDICAPPED CHILDREN’S PROGRAM
IN THE DEPARTMENT OF HEALTH**

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. 25-1-107 (1), Colorado Revised Statutes 1973, 1982 Repl. Vol., is amended BY THE ADDITION OF A NEW PARAGRAPH to read:

25-1-107. Powers and duties of the department.

(1) (aa) To operate and maintain a handicapped children's program to provide and expedite provision of health care services to children who have congenital birth defects or who are the victims of burns or trauma or children who have acquired handicaps.

This amendment was passed and signed into law on May 23, 1983. Title V of the Social Security Act, Section 501, also gives authority for the existence of a program for serving children with special health care needs.

In addition to the above legislation, Colorado has specific statutes regarding newborn screening. The Newborn Screening and Genetic Counseling and Education Act was added to Article 4 of title 25 of the Colorado Revised Statutes 1973 in 1981. This act established the Department of Health's obligation to administer state programs for newborn screening, and specifically mandated testing for phenylketonuria, hypothyroidism, abnormal hemoglobins, galactosemia, homocystinuria, and maple syrup urine disease. Testing for cystic fibrosis was added in 1987, and biotinidase deficiency, in 1988. The Legislature then revised the legislation to allow the State Board of Health to update the list of mandated tests, so that the legislation did not have to be rewritten each time a new test became advisable.

In 1997, legislation was passed requiring increased availability of newborn hearing screening at Colorado birthing hospitals. A goal of at least 85 percent of all newborns to be screened was set and met for July 1, 1999. A Colorado Infant Hearing Advisory Committee was also established, and charged with providing information on progress toward the goal.

1.5.1.2 Program Capacity

The Family and Community Health Services Division contains numerous programs, with those funded by Title V shown on page 8. The preventive and primary care services that these programs provide are described below under the headings Preventive and Primary Care Services for Pregnant Women, Mothers and Infants; Preventive and Primary Care Services for Children; and Services for Children with Special Health Care Needs. A fuller description of each of the programs in the Division can be found at <http://www.cdphe.state.co.us/fc/fchom.asp>.

Preventive and Primary Care Services for Pregnant Women, Mothers and Infants

Women's Health Services

Women's Health Services provides prenatal care and enhanced services to women through its organized health departments and local nursing services in those communities where uninsured women would otherwise not be served. Direct care is in the form of clinical prenatal care, and enhanced services are preventive services such as smoking cessation and nutritional counseling provided through the Prenatal Plus Program.

Newborn Screening Program and Newborn Hearing Screening Program

The Newborn Screening Program, under the Genetics Program, provides immediate testing of all infants born in the state, diagnosing a variety of metabolic and genetic diseases and following up over 700 presumptive positive screens annually to make sure that the infants diagnosed with inborn conditions receive referral and treatment. Likewise, the Newborn Hearing Screening Program tests the hearing of infants at birth and refers and follows about 120 infants each year.

Preventive and Primary Care Services for Children

Child, Adolescent and School Health Section

The Child, Adolescent and School Health Section is dedicated to protecting and promoting optimal health and development of all of Colorado's children and adolescents. State support is targeted toward prevention of illnesses and injuries; protection of children's health; addressing disparities in health status based on ethnicity, age, gender and socioeconomic factors; increasing the capacity of local public health resources; and increasing the capacity of schools to serve as partner sites for improving the health of children and adolescents.

Prevention helps to assure that steps are taken to educate the public about the role of building protective factors and reducing risk factors that contribute to the major causes of death and disability. Immunizations prevent diseases among the entire population and are promoted by supporting laws, developing programs, providing and administering vaccines, tracking immunizations, and providing education and information. Other examples of prevention roles include prevention of lead poisoning; teen pregnancy; unintentional and intentional injury (including suicide); and alcohol, tobacco and other substance abuse.

Examples of protection provided for children include assuring clean air, soil, and water and safe food; promoting development of community systems of health care; and developing policies that protect children and adolescents from abuse, second-hand smoke, and other hazards.

The Section, in partnership with other Division staff and Department programs, addresses health issues such as ongoing access for all children to well baby/child/adolescent periodic care in doctor's offices or clinics, sick care, and emergency health care; screening for handicaps such as those of vision, hearing, and development; referrals for other services such as those provided by the Health Care Program for Children with Special Needs (HCP); parent education classes; initiatives to reduce causes of mortality and morbidity; timely immunizations for all children, those lacking access such as the uninsured, and those in rural areas with limited resources; and enrollment of eligible uninsured children in Medicaid or the Child Health Plan Plus, a low or no-cost plan offered by the state. In addition, the Section addresses the issues of teen pregnancy and sexually transmitted infections (STIs), with support for abstinence education and comprehensive approaches to teen pregnancy and STI prevention. Other areas of responsibility include Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) outreach and case management to advise eligible families of services to which they are entitled and facilitate utilization; child care of 200,000 Colorado children in licensed and non-licensed programs, centers and homes; school health provided by school nurses and school-based health centers; oral health with dental caries (tooth cavities) being the most common chronic disease of childhood and few resources and with use of dental benefits for children enrolled in Medicaid being very low.

The Section also is involved with efforts associated with asthma and lead poisoning prevention;

infant deaths; Child Fatality Review, and injury prevention, with efforts to reduce the numbers and severity of injuries and death, especially those associated with vehicles, guns, substance abuse, risk-taking behaviors, violence and suicide.

Asthma Surveillance

The Division will establish asthma surveillance beginning August 2000 with the receipt of a Centers for Disease Control \$200,000 three-year grant. Five Denver hospitals and the School-Based Health Center system will participate at the outset, and statewide expansion is planned. An effort will be made to correlate ambient air quality data with metro-area surveillance data to determine the relevance of air quality as an asthma trigger. Grant activities also include developing educational materials to be distributed to schools, medical providers, and students, and building an asthma coalition to include hospitals, community organizations, and the American Lung Association.

Healthy Child Care Colorado

Healthy Child Care Colorado is a Community Integrated Service System (CISS) initiative and is located in the Family and Community Health Services Division at the Colorado Department of Public Health and Environment. This initiative recognizes the need to integrate health prevention and promotion activities within the child care setting to assure high quality care and healthier children through consultation, training, and education of staff. The goals of Healthy Child Care Colorado are to provide safe and healthy child care environments; to increase accessibility to immunizations, and to provide access to quality health, dental and developmental screenings and follow-up. The initiative is a valuable and educational resource to center and family child care providers throughout the state and works closely with key statewide organizations including many programs within the Health Department. Linkages and partnerships have been developed with the National Resource Center for Health and Safety in Child Care, located at the University of Colorado Health Sciences Center; the Colorado Chapter of the American Academy of Pediatrics; The Children's Hospital; the Colorado Department of Human Services Division of Child Care; Colorado Office of Resource and Referral Agencies (CORRA); Medicaid and the Children's Basic Health Plan; and the Early Childhood Summit, whose membership represents twelve key child care organizations and agencies. Programs within the Health Department sharing information and resources are the Child and Adult Care Food Program; other programs within the Child, Adolescent and School Health Section; EPSDT; Immunization Program; Migrant Program; Health Care Program for Special Needs Children, Consumer Protection; Epidemiology; Injury Prevention; and Lead Screening Program.

Children's Health Insurance Plan

The passage of the Children's Health Insurance Plan (CHIP) in the United States Congress in 1997, along with the 1997 passage of the Children's Basic Health Plan by the Colorado Legislature, is now providing many more children in Colorado with the opportunity to have health insurance coverage. Approximately 24,631 (as of March 31, 2000) children have been enrolled

in the new "Child Health Plan Plus," the program that implements the Children's Basic Health Plan. The target for the end of FY 00 is 32,300.

The Department received a one million dollar, three-year grant, the Colorado Covering Kids Initiative, in January 1999, from the Robert Wood Johnson Foundation. Objectives of the Initiative are to: simplify the enrollment processes into both the children's basic health plan and Medicaid, enhance and develop innovative outreach and marketing strategies, and promote interagency collaboration to support the enrollment of children into health insurance plans. The Department's Child Health Program Director is the Covering Kids Project Director.

During 1999, the Initiative played a major role in the development, improvement and testing of a single consolidated application for CHP+ and Medicaid, allowing for children to be screened for eligibility for one or the other program at the same time. The process for families to enroll their children was further simplified through changing policies and procedures as a result of interagency cooperation facilitated by the Covering Kids staff. Addressing transportation, language and cultural issues, and developing community networks to facilitate outreach and ease the enrollment process have all been accomplishments of the Initiative at the state level as well as in the communities of the three local Covering Kids partners. We have also seen a trend toward increasing Medicaid enrollment in the State's Medicaid-only program, and indications are that these are children who lost Medicaid as a result of welfare reform who are now being re-enrolled because they are eligible as defined in the 1996 Federal Welfare Reform legislation.

Abstinence Education

The Colorado Abstinence Education Program, founded in the fall of 1997, is implemented through a collaborative effort between Governor Bill Owens' office and the Colorado Department of Public Health and Environment. The Program's goal is to reduce out-of-wedlock births and sexually transmitted diseases in teens and to encourage sexual abstinence until marriage by:

- Supporting abstinence-only education programs for school age children, males and females, grades 5 through 12
- Developing and implementing strategic, statewide communication efforts designed to increase awareness and acceptance of abstinence as a healthy choice and a positive lifestyle
- Involving parents and the community in the development and implementation of programs and activities that are accessible and promote abstinence decisions.

Since March 1998, the state has been funding abstinence education programs in all four quadrants of Colorado. Currently, eight organizations throughout the state are receiving funds to support programs in their communities.

Now in the third year of the Federal Title V Abstinence Education grant, the state is modifying its program to increase potential statewide impact. For the period beginning July 1, 2000 through

June 30, 2002, the Program will again support select, local abstinence education programs offering direct services to youth and their families.

As a complementary factor to the program support, the Program will also launch a statewide public awareness campaign in the fall of 2000. This will be a multi-dimensional campaign incorporating a variety of public relations and marketing strategies to send strong, proactive abstinence messages to teens, their parents, and community leaders.

School and Adolescent Health Grants

During FY 99, the Adolescent Health Program developed a new Request for Proposal process to fund communities in the state to address the state and national MCH performance measures related to adolescent health. The Request for Proposal was for "School and Community Partnerships for Adolescent Health Promotion." Minimum requirements for applicants included a local partnership involving at least a school or school district, a health entity (public health agency, community health center, hospital, or other health care providers), and a youth serving agency; agreement to address more than one of the MCH performance measures; the implementation of multi-faceted strategies to improve adolescent health; and the inclusion of positive youth development as a major component of the effort.

Four proposals were selected for MCH funding in the FY 00 year. Two projects are in Jefferson County, one is in Garfield, and one in Boulder County. The four programs are implementing a wide variety of youth development programs that focus on youth leadership, youth involvement in the community/community service, building development assets, and addressing the male role in teen pregnancy prevention and fatherhood. In addition, the programs also focus on youth tobacco prevention, developing a family resource center to connect youth with multiple community resources, youth-driven efforts to reduce high risk behavior, youth and adult partnerships for school violence prevention, and much more.

Suicide Prevention

In November 1998, the Suicide Prevention Advisory Commission, appointed by Governor Romer, released a 50-page report on suicide. This report was passed on to Governor Bill Owens in January 1999 when he became the new governor. The 1999 State Legislature did not act on the recommendations, but the 2000 State Legislature passed a bill creating a suicide prevention program within the Colorado Department of Public Health & Environment. The program will focus on building local capacity to be more effective in suicide prevention. The placement of the program within the state health department will be decided during FY 01, but it will most likely be placed within the new Division of Prevention.

Oral Health Program

The Oral Health Program, under the Rural & Primary Health Care Policy and Planning Program, works to improve the oral health status of the residents of Colorado by reducing dental diseases through preventive measures and by reducing barriers to accessing oral health care. This is done primarily through preventive health measures, water fluoridation, elementary school fluoride

mouthrinses, dental sealants with the "Chopper Topper" program , and oral health education measures. The Program also interacts with WIC, Women's Health, Chronic Disease programs, and Injury Prevention to bring an oral health perspective to their health education efforts.

Services for Children with Special Health Care Needs

The Health Care Program for Children with Special Needs (HCP) serves as a focal point at the state and local levels to assess the needs of families in identifying, accessing and paying for needed health care and support services for their children with special health care needs. The program works with other programs, agencies and organizations to develop coordinated programs and community based systems of care to meet the needs of families. Through contracts with local public health agencies, HCP assists families in understanding and coordinating the resources available for care and support including Medicaid, Social Security Income (SSI), Child Health Plan Plus (CHP+), special education, and developmental disabilities services. For low-income families without insurance or whose insurance does not cover needed medical services, HCP Paid Services provides medical specialty services such as office visits to specialists, diagnostic tests, therapies, surgery, hospitalization, and expendable and durable medical equipment. Conditions covered include congenital heart disease, orthopedic conditions, neurological conditions, hearing loss, eye conditions, cleft lip and palate, cystic fibrosis, bladder and kidney conditions, and stomach and intestinal conditions.

Developmental and Evaluation Program

A part of HCP is the Developmental and Evaluation Program which provides access to comprehensive, multidisciplinary, developmental evaluation services for children under 14 years of age who have or are suspected of having a developmental delay or disability.

Care Coordination for Children with Special Health Care Needs

With the implementation of CHP+ as a program separate from Medicaid, local public health agencies have put more effort into coordinating care for children with special needs. Local public health staff help families complete applications for CHP+ benefits, choose HMOs and specialty providers, understand their benefits, work with Primary Care Providers to assure prior authorization of any specialty needs, assist in finding coverage when family income changes, and coordinate school and support services. To assist local agencies to continue to expand needed care coordination services, state and local HCP staff work to assist Medicaid, CHP+ and the HMO in understanding what these services are and why they are needed. A marketing document (Supporting Documents) for HMOs was developed and distributed during the numerous meetings that were held over the last year. Strong relationships have been built with Colorado Access, Rocky Mountain HMO, Kaiser Permanente and Colorado Health Plan of the Rockies (CHPR). To date one contract between CHPR and HCP for care coordination services in six Denver metro counties has been signed. Two other contracts (with RMHMO and Colorado Access) are still being negotiated. Kaiser has decided to develop its internal capacity to provide care coordination with "special needs nurses". These nurses have strong relationships with the public health nurses

who provide community referral resources and consultation.

Other Programs

Programs are described below which affect populations not divided according to the age groups used in the section above.

Rural and Primary Health Care Program

The Rural and Primary Health Care Program is responsible for improving access to primary care for underserved populations in Colorado, defined according to geography or population group. This office works with the federal government to designate federal health professional shortage areas and medically underserved areas which cover much of the state's land area (see map on the following page).

Farmworker Health Services

The Farmworker Health Services (FWHS) program, under the Rural and Primary Health Care Program, operates a voucher program for migrant and seasonal farmworkers and their families. The program operates offices in Palisade, Olathe and Fort Collins. In addition, the FWHS program has a contract with the public nursing service in Cheyenne to provide services to farm workers on the eastern plains. The FWHS offices enroll eligible migrant and seasonal farmworkers in a federal program that provides the vouchers which clients can take to participating dentists and primary care providers to receive needed health care. The health service coordinators in each office also provide health education and preventive services. All the FWHS staff receive training in selected MCH objectives that are relevant to the farm worker population and this year the program's quality assurance plan will monitor progress throughout the migrant season. Last year the program served about 3,600 clients, an increase of approximately 20 percent over the previous year. Enrollment is expected to reach 4,000 clients this year.

The Program continues with plans to decentralize some of its services by supporting more staff in its field offices and rural parts of the state. This is in concert with federal interest, encouraged by private efforts, in moving the program to private health care providers. This year the program will expand its reach through the Cheyenne County Public Health agency or the local health department in the Northeast corner of the state. The county nurse in Cheyenne Wells registers and screens eligible clients and refers them to local providers who have agreed to accept the Farmworker Health Services voucher as payment. More migrant farm workers are moving to the eastern plains following the availability of farm jobs in the booming economy.

Insert HPSA map

State Systems Development Initiative

The State Systems Development Initiative (SSDI) is also located in the Rural and Primary Health Care Policy Section, which facilitates coordination of Title V planning with the Office of Primary Care and with the Colorado Community Health Network, the Primary Care Association. The focus of activities for the SSDI Coordinator is implementation of a new state and local maternal and child health needs assessment and planning process. This process is designed to be information-based and cyclical. Support for the development of County MCH Data Sets to be used in the assessment and planning processes has been a key activity for FY 01, which will be continued with development of additional county level data, providing data on health disparities wherever possible.

1.5.1.3 Other Capacity

Family and Community Health Services Division Staff

The Director of the Family and Community Health Division is Merrill Stern, who has served in this position since 1997. Ms. Stern has an extensive background in state and local health and human services. Prior to joining the Department, she held several key positions in the developmental disabilities system. At the state health department, she was Director of the Office of Health for seven years prior to becoming the Family and Community Health Services Division director.

Family and Community Health Services Division staff is highly qualified; virtually all program directors possess master's level certification in public health, public administration, finance, or nursing. The staff consists of public health nurses, a physician, demographer, information systems coordinator, nutritionists, social workers, a physical therapist, an audiologist, a speech pathologist, health educators, dental hygienists, systems staff and clerical support.

Child, Adolescent, and School Health Section Staff

The Child, Adolescent and School Health Section is directed by Barbara Ritchen, who has a Bachelor of Science in Nursing and a Master's Degree in Health Education. The staff of sixteen includes a wealth of expertise and experience, including three master's prepared nurses, and a licensed clinic social worker. The National Center for Leadership Enhancement in Adolescent Programs (LEAP), is also included in the Section. This MCH-funded Center provides national training and technical assistance with the goal of enhancing leadership and the capacity of state and local systems to improve adolescent health. A prevention specialist helps implement the Assets for Colorado Youth Statewide Partnership Grant and an arrangement with the Centers for Disease Control and Prevention provides national technical assistance and expertise related to tobacco prevention.

Health Care Program for Children with Special Needs Staff

The state staff of the Health Care Program for Children with Special Needs (HCP) is provided

overall direction and program coordination by Joan Eden, MSPH, R.D. All of the consultation staff, which includes nurses, audiologists, a speech pathologist, a nutritionist and a physical therapist, are licensed or certified in their discipline and most have master's degrees; the director of Clinical Development and Evaluation has a doctoral degree as does the physical therapist.

Two long time Nursing Consultants in the Health Care Program for Children with Special Needs (HCP) retired recently, Jan McNally in October 1999, and Patsy McAteer in February 2000. With many months of advanced planning for these retirements, the program worked with internal staff and external stakeholders to assess the current staffing needs in HCP, especially in relation to the move toward core public health functions. It was decided to consolidate all of the nursing functions of the two positions into one position, and to allocate the data functions and the administrative responsibilities to new positions.

In March 2000 Shirley Babler, R.D., who had worked half time as a WIC Nutrition Consultant and half time as the HCP Nutrition Consultant, was promoted to HCP Clinical Services Manager. In this capacity she is working full-time for HCP overseeing the administrative portion of the direct service program for children with special health needs. She also continues her role as HCP Nutrition Consultant.

A new HCP Nursing Consultant was hired in June 2000. Lynn Bindel, R.N., M.S., joins the interdisciplinary team of consultants who have responsibility for the eligibility criteria and quality assurance efforts for the direct service program, and the technical assistance and consultation to local health agencies. Lynn served as the HCP Regional Team Leader in Weld County prior to coming to the state health department.

A new position was created to assist in building data capacity within HCP. Final selection for the half-time data analyst position is in progress. This new position will have responsibility for working with data available from other sources such as Medicaid, HMOs and CHP+ to help look at the broader systems building needs related to the accessibility and quality of services for children with special health care needs beyond the HCP direct service system.

Resource Consultant at Children's Hospital

HCP continues to fund a position at the Children's Hospital to coordinate the inpatient and outpatient services provided through the hospital with those needed and provided in the community. Libby Speers, R.N., provides a valuable link to public health nurses all over the state and the hospital. The nurses alert each other to imminent hospitalizations or discharges, needed special services such as interpretation or transportation, coordination between special clinics or providers and support services in the community.

1.5.2 State Agency Coordination

MCH staff coordinate with other state agency staff on almost a daily basis through numerous coalitions, task forces, advisory groups, committees, cooperative agreements, and more. Colorado has a long history of collaboration across agencies. One example of this is in the implementation of the State Children's Health Insurance Program, with collaboration between MCH, which houses the Robert Wood Johnson-funded Covering Kids Program, Health Care Policy and Financing, and Child Health Advocates. Another example is the National Governor's Association technical assistance grant awarded to Colorado for youth policy development. A team from Colorado, which included Governor's Office staff; the executive director of Human Services; the executive director and the director of the Child, Adolescent and School Health Section from CDPHE; staff from the Department of Local Affairs; and the vice president of the Colorado Children's Campaign, attended a two-day meeting in Boston to begin a two-year process of how we can move forward together to improve youth policy. This fits well with H.B. 1342, which was passed in May 2000, creating a new Division of Prevention, Intervention, and Treatment Services for Children and Youth within CDPHE. Prevention programs from 12 different state agencies will be working together, some of them moving to this new division within CDPHE and the others developing memoranda of understanding to better coordinate funding sources, measurable benchmarks, technical assistance, and evaluation of prevention programs and to make the process more efficient for local communities applying for funds.

MCH staff have worked closely with Department of Education staff for a number of years in supporting the coordinated school health model, the jointly funded state school nurse consultant position, and school-based health centers. In fact, the Prevention Initiatives Director at the Department of Education has long served as chair for the interagency work group for school-based health centers. MCH staff have been part of the Department of Education's comprehensive school health education advisory committee since its inception, as well as being partners in co-funding state conferences, adolescent health training, the Youth Risk Behavior Survey, and the *Adolescent Health in Colorado* report. The state Advisory Council on Adolescent Health includes representatives from the Department of Education and from both the Alcohol and Drug Abuse Division and the Independent Living Program within the Department of Human Services. The newly established Youth Partnership for Health advises both CDPHE and the Department of Human Services on policies and programs that affect adolescents.

Some of the many organizational relationships among the state human service agencies are described below.

School-Based Health Centers and Health Insurance

Colorado's 33 school-based health centers provide an ideal venue for enrolling school-age children in Medicaid and the Child Health Insurance Plan (CHIP). Recently, this has offered a number of opportunities to the 14 sponsoring organizations of these programs to ensure the

financial sustainability of these programs. Because many of Colorado's school-based health centers actively seek reimbursement for services provided to children, they have an incentive to enroll students in publicly-funded health insurance plans.

Legislative and policy decisions have strengthened the position of school-based health centers with regard to covering uninsured children. Six program sponsors serve as Satellite Eligibility Determination sites, which permits them to enroll children on-site, and to receive a small payment for this activity. In 1997, the legislature required that the state Medicaid program increase to 75 percent the proportion of recipients participating in HMOs. At the same time, the legislature required the Department of Health Care Policy and Financing to define Essential Community Providers (ECPs), which have historically served as a safety net for the medically indigent. When legislative rules were written by the Department of Health Care Policy and Financing, school-based health centers were included in the ECP definition. This ensures that HMOs must seek contracts with them for reimbursement of services provided to covered children, and that a small grant program is available to school-based health centers for funding special projects related to health services delivery. A recent statutory change to the Colorado Medical Assistance Act will permit all school-based health centers that serve as Medicaid providers to bill the fee-for-service Medicaid program for children and pregnant teens under 21.

The "Medicaid Reimbursement for Schools" program (Senate Bill 97-101) provides school districts and Boards of Cooperative Educational Services (BOCES) the opportunity to become Medicaid providers, and to claim federal Medicaid matching funds for state- and locally-funded health services provided to students enrolled in Medicaid. New dollars that are generated from the federal Medicaid match must be used to support any health service for students attending the district. This law provides school districts with the opportunity to rethink their current health programming, to form new alliances with community agencies, and to reimburse existing school-based health for the services they provide to students. The implementation of this Act is the joint responsibility of the Colorado Departments of Health Care Policy and Financing and Education. Since July 1, 1997 when it became law, Colorado Department of Public Health & Environment staff have worked with responsible officials in these two agencies to implement processes for local education authorities to participate as Medicaid providers, favorable to furthering such relationships between school-based health centers and school districts.

Without notable exception, existing local school-based health center sponsors have been involved as school districts plan the use of these new dollars. However, the amount of school district reimbursement from Medicaid has been significantly less than projected for the state as a whole. While the general sentiment among educators has been that because these funds are largely generated through special education services, the dollars should be used to bolster these underfunded programs, six school-based health center programs have received dollars for support of their school-based health center services. For example, as of March 1999, the Denver School-

Based Health Centers had received \$27,500 to support their school-based health center sites at North and Kennedy High Schools.

Unfortunately, in the last two years, interest among school officials in establishing new school-based health programs has been dampened by the state's climate regarding education reform. Colorado educators have been under intense public and legislative pressure to focus on meeting new mandated educational testing standards. Prevention Initiatives at the Colorado Department of Education, however, is collecting research that speaks to good health being a prerequisite to learning. North High School, with a school-based health center, has "made the connection" that increased academic achievement is related to the availability of the center, and may serve as a model for promoting this understanding among educators.

School-based Health Center Initiative

The Colorado School-Based Health Center Initiative is located within the Family and Community Health Services Division. A State Interagency Workgroup, comprised of representatives from key statewide organizations, provides policy direction and funding advice for the Initiative, assuring a high level of state agency coordination for policies supporting integration of resources and services for vulnerable student populations at the local level. Members include the Colorado Department of Education, the Colorado Department of Health Care Policy and Financing, the University of Colorado Health Sciences Center School of Nursing, the Center for Human Investment Policy at the University of Denver, Centura Health Systems, the Colorado Foundation for Children and Families, the Colorado Department of Human Services, and the Colorado Association for School-Based Health Care. The Colorado Department of Public Health & Environment provides staffing support.

Since its inception in November 1996, the Colorado Association for School-Based Health Care (CASBHC) has become a valuable resource for furthering development of school-based health centers. The Colorado Department of Public Health & Environment works closely with this nonprofit provider association to further its goals of removing barriers and improving access to high quality health care, and locating sustainable financing for this cutting-edge health care delivery model. The organization furthers these goals through its focus on quality improvement, contracting with managed health care organizations for reimbursement, and informing the public (especially legislators and other policy makers) of the value of school-based health care in solving some of the serious health and educational concerns among children and adolescents. CASBHC's mission is to help Colorado children achieve optimal health and maximum benefit from their education; promote the delivery of high-quality, comprehensive, accessible and affordable health care to children and adolescents in school settings; and provide leadership in the proliferation and long-term financial stability of school-based health centers.

Colorado Department of Human Services/Developmental Disabilities (DHS/DDS)

In addition to special projects and startup initiatives, the Family and Community Health Services Division ensures that there is an ongoing interface in the provision of services for the many children served through the Health Care Program for Children with Special Needs (HCP) who are also eligible for services through the Colorado Department of Human Services. Programs provided by DHS/DDS that interface with HCP include:

- C Early Intervention Services for child development for infants and toddlers birth to age 3;
- C Family Support Services Program for families who maintain a family member with developmental disabilities in the family home (all ages);
- C Children's Extensive Support Waiver (a model 200 waiver) for children birth to 18 who are considered to be the most at risk for out-of-home placement due to the severity of their needs; and
- C The Children's Medical Waiver (a model 200 waiver) for children age birth to 18 with developmental disabilities to access Medicaid State Plan benefits who would otherwise be ineligible due to parental income.

DHS/DDS is represented on the Advisory Council on Health Programs for Women and Children, a liaison that facilitates coordination of services to dually eligible children.

Colorado Oral Health Coalition

The Oral Health Program helped form the Colorado Oral Health Coalition in March 1998 to satisfy the dental advisory requirement of the Colorado Dental Care Act passed in 1997, and also to develop strategies for incorporating a dental benefit for children into Child Health Plan Plus. The Coalition, with the assistance of Blue Cross/Blue Shield Foundation of Colorado, obtained additional data on costs, developed a fact sheet for policy makers, brought in national technical assistance, and provided the Colorado Legislature with a proposal for a SCHIP dental benefit as part of one of the tobacco settlement bills. The tobacco legislation died in the 1999 session without passage of a dental benefit, but the 2000 session added the benefit beginning next year. The Blue Cross/Blue Shield Foundation of Colorado has now provided support for a Commission on Children's Dental Health, to be facilitated by the executive directors of the Department of Health Care Policy and Financing and the Department of Public Health and Environment, inviting key legislators and dental public health/public health leaders to participate. The Commission is meeting for six months beginning in May 2000 and will provide a written report and list of recommendations to the Legislature and the Governor in December 2000.

Women's Health Campaign

Another collaborative effort among state, local, federal and private entities has been the Women's Health Campaign, co-chaired by Jane Norton. The Colorado Women's Health Campaign has received grant funding and continues to be a resource to improve and maintain the health status of women 45 to 65 years of age. The major focus has been on health concerns related to breast

cancer, osteoporosis, depression, menopause and cardiovascular disease. A coalition of over one hundred organizations has assisted with several awareness raising events throughout the year.

Colorado Community Health Network

The Colorado Community Health Network, CCHN, represents sixteen community migrant health and homeless centers with over 80 health care delivery sites. The centers provide health care to low-income and underserved populations throughout much of Colorado. The newest member of CCHN is Denver Indian Health and Family Service, Inc. Farmworker Health Services, the voucher program for migrant and seasonal farm workers administered by the Colorado Department of Public Health and Environment, is also a member of CCHN.

Colorado's Primary Care Office, the Rural and Primary Health Care Program, works jointly with CCHN (also known as the Colorado Primary Care Association) on the objectives contained in a cooperative agreement to improve accessibility and expand primary care services to targeted low-income and vulnerable populations. These efforts include information and data sharing, resource and service building, joint training, and policy development. The agencies work together to support areas within the state that lack sufficient primary care capacity to meet the needs of their residents and to assure that programs to address the resource shortages are made available to these communities. The Rural and Primary Health Care Program Director meets at least monthly and communicates regularly with CCHN representatives to coordinate efforts. In addition, CCHN has a representative on several committees within the Colorado Department of Public Health & Environment, including the Advisory Council on Health Programs for Women and Children, where the Director of CCHN, Annette Kowal, is the representative.

Funding has been provided to the Primary Care Association in each state to undertake an analysis of the health care markets in which the community and migrant health centers operate. The analysis provides information about utilization of community health centers relative to the population within the service area, and characteristics of the market such as managed care penetration and demographic trends. This year, the Director of the Rural and Primary Health Care program, the Oral Health Program Director, the Region VIII Dental Director and the Director of CCHN are working together to add dental health resource and health status information to the analysis. Representatives from CCHN attended the sessions on MCH needs assessment and planning that were conducted around the state, and county data collected for the local planning efforts were shared with CCHN so that the information could be added to the marketplace analysis. CCHN used a community development grant from the Bureau of Primary Health Care to assist four Colorado communities with a review of their health care environment. The results have been published and provided to participants including local public health agencies. These efforts support and complement local MCH planning.

Increasing coordination with the Primary Care Office and the Primary Care Association was one of the recommendations from the Maternal and Child Health Bureau in its review of Colorado's

FY 99 block grant application. The activities described above amply demonstrate that we are working closely with the Rural and Primary Health Care program and with CCHN. In the months ahead we anticipate further cooperative work based on our Year 2000 Needs Assessment.

University of Colorado Health Sciences Center

The Colorado Department of Public Health & Environment coordinates many activities with the University of Colorado Health Sciences Center. For example, a second annual Care Coordination Conference to address issues of children with special needs was presented with telecommunications technology in March 1999. More than 200 individuals from many disciplines and numerous community-based organizations participated in this event which was sponsored jointly by the School of Nursing and the Department. Additionally, the School of Nursing and the Department are working together to identify public health nursing competencies and educational needs to assure that the state has a public health work force of high quality. Finally, we are working with the Colorado Rural Immunization Services Program, which is a five-year, \$5 million program through the University. This project assesses and improves the delivery of immunizations in areas designated as Health Provider Shortage Areas (HPSA's).

HCP staff continue strong relationships with the faculty and staff of the JFK Partners, Promoting Families, Health and Development, Colorado's University Affiliated Program. The programs continue to jointly fund two staff positions, which serve as faculty to JFK and consultants in social work and physical therapy to HCP. This arrangement has assured coordinated planning, implementation and evaluation of numerous joint projects. The HCP staff and JFK faculty continue to meet monthly to assess educational and training needs of providers working with children with special needs, review and comment on legislation, and develop and implement projects. Samples of the coordinated activities this year include two projects. In one project the programs co-funded graduate residents in physical therapy who worked with HCP to assess the barriers to access to therapy services for children in Medicaid who live in rural areas. This project pointed out the very complicated system that parents must struggle through in order to coordinate private insurance and Medicaid benefits for therapy. In another ongoing effort, JFK and HCP have worked collaboratively in the use of tele-health for expanded educational offerings to local public health staff and community providers across the state and for the beginnings of clinical service delivery to rural areas through two pilot tele-medicine projects.

Aurora Healthy Start Initiative

The Aurora Initiative is a response to exceptionally high infant mortality in two zip codes located on either side of East Colfax Avenue in Aurora, Colorado, on the eastern edge of Denver. This effort was funded by MCHB Healthy Start Initiative grant STH-08C067 awarded in August 1998. After initial administrative organizing, the project got underway in November 1998 immediately after the annual Healthy Start Continuing Education Grantee Meeting in Washington, D.C. Currently, the project is fully staffed and has office space.

The nature of the project is a peer-driven process that seeks to get women into prenatal care and keep them there while helping them with the difficulties of their daily lives. These women are economically disadvantaged and live in motels or lesser accommodations along East Colfax Avenue. Their primary needs are often those of basic survival. The project intends to have a salutary effect on pregnancy outcome by positively affecting health risks during pregnancy. The effort is guided by a consortium made up of local community members and health and community service providers. This includes the Title V agency of the Colorado Department of Public Health & Environment.

Colorado's Title V agency continues to assist in this process by providing guidance to the project through the consortium process, assisting with demographic information and health risk information for the two zip code area and sharing materials and resources from Title V agency programs. In addition, technical assistance from the Title V agency has resulted in establishment of a formal countywide child fatality review in both the counties in which the project is located. At present, Fetal Infant Mortality Review is not a part of this process but is being discussed in both counties. The counties will be working closely with the state Child Fatality Review.

Mortality Reviews

The Colorado Department of Public Health & Environment has been a leader in a collaborative effort to review all child deaths in the state. Multi-disciplinary teams from many departments and agencies work together to determine the underlying causes of children's deaths and to promote preventive programs that may help reduce premature death. The agencies involved include the Colorado Division of Criminal Justice, the Colorado Department of Human Services, the Colorado Department of Education, the Division of Youth Corrections, the Kempe National Center, the Colorado SIDS Program, local city and county police departments and coroner's offices, local district attorney's offices, Denver Child Advocacy Center, the Health Statistics and Vital Records Section at CDPHE, and the Children's Hospital. Separate reviews of maternal mortality are also taking place.

A grant from the Maternal and Child Health Bureau began funding the coordination of all maternal and child health mortality reviews in September 1998. Coordination consists of a combination of efforts between the Maternal Mortality Review and the Child Fatality Review, which includes Infant and SIDS review. The resulting improved coordination of these programs, especially maternal and neonatal mortality with child mortality, is already facilitating the development of a systematic process for utilizing the findings and recommendations in assessment efforts, program planning, and evaluation in maternal and child health. In addition, local child fatality review team development is also being aided under the auspices of the grant. A number of examples of state agency coordination have been provided in this section, but this list is not exhaustive. Other examples are provided in the text in other sections, particularly where performance measures are discussed.

II. REQUIREMENTS FOR THE ANNUAL REPORT

2.1 Annual Expenditures

Information on expenditures is contained in Form 3, Form 4, and Form 5, which are in the Supporting Documents section of this application in Section 5.4.

2.2 Annual Number of Individuals Served

Information on the number of individuals served in Colorado is contained in Forms 6, 7, 8, and 9. These forms are also in the Supporting Documents section of this application in Section 5.4 following Form 5. Forms 6, 7, 8, and 9 are each one page long.

Form 6 shows a total of 58,277 newborns screened. Form 7 shows an unduplicated count of 178,926 pregnant women, children, adolescents, and others served. Form 8 shows that there were 59,550 deliveries in the state and their racial composition and the number served by Medicaid. Form 9 provides information about the Family Healthline.

2.3 State Summary Profile

A brief summary of Colorado's maternal and child health services and funding is contained on the two pages of Form 10, in Section 5.4.

2.4 Progress on Annual Performance Measures

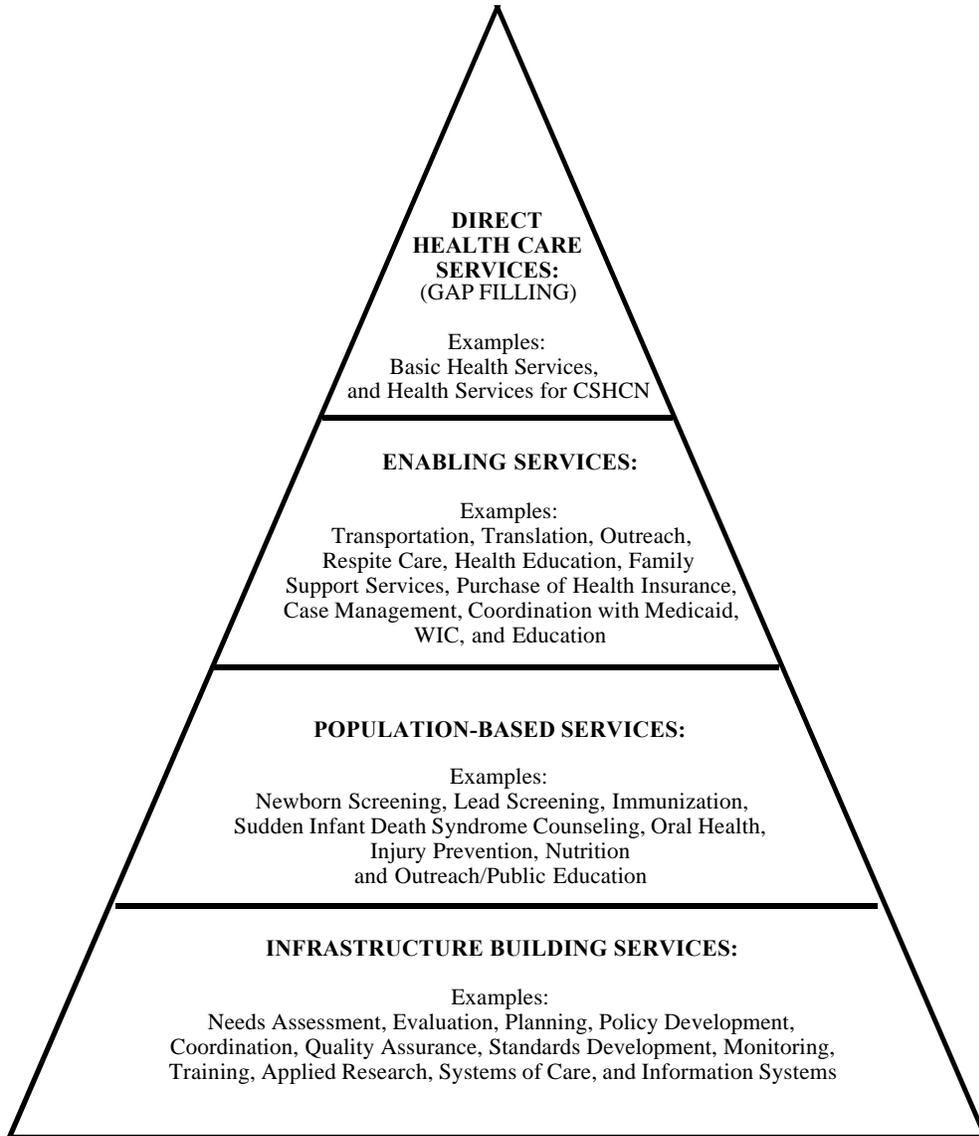
We describe in this section the accomplishments during FY 99 that occurred in Colorado, following the design of the "pyramid," and using the national and state performance measures. We move from discussion of direct health care (top level), to enabling services (next level down), to population-based services (one level above the bottom), to infrastructure-building services (bottom level). The pyramid is provided on the next page, labeled as Figure 2.¹ Within each pyramid level, we discuss what happened during the year, first for pregnant women and infants, next for children, including adolescents, and last for children with special health care needs.

The numbering order of national performance measures, from 1 through 18, was based on the level of the pyramid to which they were assigned, and on their "type" (capacity, risk factor, or process). The state performance measures that are shown in the discussion below follow the same numbering system. However, the numbering of the national and

¹ The numbers of the figures were determined by the MCH Block Grant Guidance, and cannot be changed. There is no Figure 1.

Figure 2

CORE PUBLIC HEALTH SERVICES DELIVERED BY MCH AGENCIES



state performance measures may not appear to be logical in this discussion, because within each pyramid level, the information is requested not by type (capacity, risk factor, or process), but by “population group.” Those measures which pertain to pregnant women and infants are discussed first, those that pertain to children and adolescents are shown second, and those that pertain to children with special health care needs are described last. Within each population group, national measures are shown first, and state measures are shown second. This different sequence is requested by the guidance, with the result that the ordering of the measures appears somewhat arbitrary.

Direct Services: Pregnant Women, Mothers and Infants

There are no national performance measures under this heading, and Colorado’s state performance measures do not include any that measure direct service.

Direct Services: Children

There are no national or state performance measures under this heading.

Direct Services: Children with Special Health Care Needs

National Performance Measure 1

The percent of state SSI beneficiaries less than 16 years old receiving rehabilitative Services from the state CSHCN Program

Data for FY 99, from the new Integrated Registration and Information System (IRIS), show that 3.0 percent of all children on SSI received rehabilitative services from the state CSHCN Program, 189 children out of 6,230 less than 16 years old and on SSI. The numerator reflects children on the state program only between March and September 1999, and is considered to be an undercount for the year because of this. No targets had been set for this measure for FY 98 or FY 99. FY 00 will be the first year with 12 months of data.

In Colorado all SSI beneficiaries under 16 years of age are automatically eligible for Medicaid. EPSDT outreach workers at the local level make telephone calls to all newly enrolled SSI beneficiaries to assess whether the child’s medical and support needs are being met. In the majority of cases, Medicaid is covering all of the medical needs. Families are often knowledgeable about other community supports, but when they are not the EPSDT workers make the referrals. When families have more complex medical or psychosocial needs, the HCP staff in the local health department becomes involved. These families are enrolled for “Care Coordination Only,” assisted in defining their needs and in developing plans to meet them.

Because most of the contact with families on SSI is for Care Coordination and not medical or typically rehabilitative needs, Colorado has chosen to include care coordination services in its definition of “rehabilitative services.”

National Performance Measure 2

The degree to which the state Children with Special Health Care Needs (CSHCN) Program provides or pays for specialty and subspecialty services, including care coordination, not otherwise accessible or affordable to its clients

In FY 99, the Health Care Program for Children with Special Needs (HCP) provided or paid for all nine specialty services listed, meeting the target. Nutrition and care coordination services were provided by public health staff in local health departments and county nursing services. The seven other services were paid through fee-for-service contracts with individual providers and health care facilities.

With the implementation in April 1998 of the state child health insurance plan, Child Health Plan Plus or CHP+, we began to see dropping enrollment for HCP direct service benefits, falling by 14 percent by the end of the fiscal year. However, the enrollment for “Care Coordination Only” rose by 27 percent during the same time period. While we had expected the number of therapy services and durable medical equipment requests to decrease due to the new coverage through CHP+, we had also expected that there would be an increase in the number of requests for “wrap-around” services. With CHP+ maximum benefit caps on therapies, hearing aids and equipment, we were prepared to take on the payment of high cost services and items, which went over the caps. This has not happened except for hearing aids. The emphasis on newborn hearing screening and follow-up in Colorado has assured that all families with children with hearing loss know of the resources for hearing aids. However, we have not seen a corresponding shift for therapies and equipment.

In the early days of the program, it was possible that the HMO covered some of these items before all the rules were understood. However, it is more likely that families are told that CHP+ will cover some portion of the cost and that the family is responsible for the rest of the bill. With a new program and so many providers to educate, providers and families are still confused, even though we have done dozens of presentations to explain the “wrap-around” benefits of HCP. With the assistance of a new Children’s Comprehensive Care Project grant, funded through the Center for Health Care Strategies, we will be working more closely with the Department of Health Care Policy and Financing and the CHP+ program to educate the HMO and Primary Care Providers and specialists about the “wrap-around” benefits through HCP.

HCP has continued to work to broaden the multi-disciplinary support for families at the local level. By the end of FY 98 all but one of the thirteen regional offices had Social Workers on their teams to assist in providing more comprehensive Care Coordination.

Enabling Services: Pregnant Women, Mothers and Infants

There are no national or state performance measures under this heading.

Enabling Services: Children

State Performance Measure 1

The proportion of high school students reporting having drunk alcohol in the past month
The target for this performance measure, one of Colorado's objectives dating from 1995, was set at 45 percent for FY 99. The most recent weighted Youth Risk Behavior Survey (1995) found a 53 percent level among high school students. Unweighted data for 1999 determined the level at 59 percent. Therefore, the target does not appear to have been met, and the trend appears to be in the wrong direction.

Efforts of Title V programs to deal with this issue of teen alcohol use and abuse have been incorporated into broader adolescent health programs for a number of years. In the past year, there has been increased focus on positive youth development, resiliency, protective factors, and building developmental assets as an integral part of reducing youth alcohol use and other risk behaviors. The four MCH-funded "School and Community Partnerships for Adolescent Health Promotion" focus heavily on positive youth development and youth leadership, in addition to risk reduction. Child, Adolescent and School Health Section staff are part of a statewide coalition, led by the Colorado Department of Transportation (CDOT) and funded by the Office of Juvenile Justice and Delinquency Prevention, to attempt to reduce underage drinking and driving. This group involves not only CDOT and CDPHE, but the Alcohol and Drug Abuse Division of Human Services, the liquor industry, law enforcement, and many others. Reducing teen alcohol use is a long-term challenge which needs to and does involve many other entities besides maternal and child health agencies.

In recent years, school-based health centers have begun locating drug and alcohol counselors on-site to do assessment and referral of students identified with alcohol problems. In addition, students are frequently offered in-school alcohol treatment programs as an alternative to suspension.

Enabling Services: Children with Special Health Care Needs

National Performance Measure 3

Percent of children with special health care needs in the state who have a medical/health home

We estimate that 17.8 percent of all children with special health care needs had a medical/health home in Colorado in FY 99. No target had been set for FY 99.

The following assumptions were used in creating the estimate:

- that 18 percent of all children in the state have some kind of special health care need. This is based on the 1998 Newacheck article.² With an estimated 1,274,300 children in Colorado in 1999 who were less than 21 (the age specified for this measure), the

² "Epidemiologic Profile of Children with Special Health Care Needs," *Pediatrics*, Volume 102, Number 1, July, 1998, pp.117-123.

estimate of all those with some kind of special health care need is 229,375. The denominator for the percent calculation is therefore 229,375.

- C that there are 40,900 children with special health care needs who have a medical/health care home. This figure is used as the numerator for the percent calculation. The 40,900 includes a reported 18 percent of all children registered with the Health Care Program for Children with Special Health Care Needs (1,300 out of 7,224, based on new data from IRIS); plus an estimated 18 percent of all children enrolled in the Child Health Plan Plus as of September, 1999 (3,800 out of 21,289); plus an estimated 18 percent of all children who received Medicaid coverage in FY 99 (35,800 out of 198,897).³
- C that no estimate is made of special health care needs children whose insurance coverage is private and whose source of primary care qualifies as a medical/health care home. These children are excluded from the numerator.

The 17.8 percent calculated as the proportion of special needs children with a medical/health home is considered to be a rough approximation of the true proportion. Further work at the national level, especially the survey beginning in July 2000 which will determine the total number of children with special needs in each state, will be a great help in our understanding of the extent of the need. Further development of data systems among providers that serve special needs children would also assist in an improved estimation of those who actually have a medical/health home.

Population-Based Services: Pregnant Women, Mothers and Infants

National Performance Measure 4

Percent of newborns in the state with at least one screening for each of PKU, hypothyroidism, galactosemia, hemoglobinopathies

During FY 99, an estimated total of 97.4 percent (58,277 out of 59,816) of all births occurring in Colorado received at least one screening (see Form 6), meeting the target of 95 percent. Since screening is under the auspices of the Colorado Department of Public Health & Environment, the level is a direct reflection of the current well-established system. Followup of those newborns identified at risk with these conditions has also consistently been well above 95 percent. In FY 99, followup for all conditions was 100 percent.

National Performance Measure 5

Percent of children through age 2 who have completed immunizations for measles, mumps, rubella, polio, diphtheria, tetanus, pertussis, hemophilus influenza, and hepatitis B

Increasing the proportion to 90 percent of children who have completed their immunizations by age two has been a national and state objective for at least the last five years. For the period July 1998 to June 1999, the 4:3:1:3 rate for children in Colorado (age 19-35 months) was 75.7 percent. The target for FY 99 (90 percent) was not met, although Colorado achieved 90 percent or greater for 3 DTaP shots (96.9 percent); 3 polio shots (91.6 percent); 1 measles-containing vaccine or MMR (92.7 percent); and 3 Hib shots

³ All children (100 percent) of those in CHP+ and Medicaid must have a PCP, therefore all children estimated to be special needs children in those programs (18 percent of the total number of children served by each program) are assumed to have a PCP.

(93.8 percent). Colorado attained a level of 83.0 percent on the 4th DtaP, which was the primary reason for failure to meet the overall 90 percent target.

National Performance Measure 9

Percentage of mothers who breastfeed their infants at hospital discharge

Colorado's target for breastfeeding initiation was set at 85 percent for FY 99. Pregnancy Risk Assessment and Monitoring Surveillance (PRAMS) data for 1998, the second year for which we have PRAMS data, show a level of 81.9 percent, up from 81.0 percent in 1997. Although the 85 percent target was not met, this rate compares very favorably to a 64 percent national average (Ross Mothers' Survey, 1998). Breastfeeding promotion efforts continue, and attainment of an 85 percent rate by the year 2000 is entirely possible.

Colorado efforts in breastfeeding have begun to turn toward improvement in duration rates. The Healthy People 2000 objective is that 50 percent of all mothers will be breastfeeding at six months. Ross Mothers' Survey data for 1998 reveal that Colorado's six-month rate is 39 percent. PRAMS data reveal sharp declines in breastfeeding in the postpartum period, such that 5 percent of those who initiate breastfeeding stop breastfeeding within a week, another 5 percent stop within two weeks, another 5 percent stop within 3 weeks, and so on. By the end of six weeks, close to 30 percent of all the women who began breastfeeding have stopped.

National Performance Measure 10

Percentage of newborns who have been screened for hearing impairment before hospital discharge

The percentage of newborns screened for hearing impairment for calendar 1999 is estimated to have been 87 percent, meeting the FY 99 target of 85.0 percent. In 1997, The Colorado Legislature passed House Bill 97-1095, which required that 85 percent of newborns be screened by July 1, 1999 or the Board of Health would promulgate rules and regulations. Since the requirement was met no further rules will be promulgated.

The Colorado Department of Public Health and Environment with the collaboration of several departments and programs (Vital Records, Newborn Genetic Screening and HCP) has developed a data management and tracking system through the use of the electronic birth certificate. Most hospitals are implementing the software and will use this to transfer the individual results of the hearing screening directly to the state's Health Care Program for Children with Special Needs (HCP). Monthly reports are then sent back to the hospitals to update further screening or referral information on infants who did not pass, were missed or who transferred. The goal is to track infants through the entire process to assure appropriate and timely follow-up.

The University of Colorado was awarded an MCH Grant on April 1, 2000 (CFDA #93.110ZZ). The purpose of this project is to establish a comprehensive newborn hearing system with appropriate and timely diagnosis, amplification fit and intervention. This comprehensive plan is designed to circumvent the potential negative sequelae of hearing loss upon communication and general development. Coordination among agencies through the existing Colorado Infant Hearing Advisory Committee, task forces and

proposed networks, will be responsible for dissemination of materials, data collection, enhanced opportunities for parent to parent contact, and the refinement of the Colorado Newborn Hearing Program.

State Performance Measure 2

The proportion of all pregnancies that are unintended

Colorado's objective for FY 99 (calendar 1998) set this target at no more than 38 percent of all births. PRAMS data for 1998 yield an estimate of 37.3 percent unintended among all births, meeting the target.

Since the true denominator in this measure is all pregnancies, rather than all births, however, we are refining our measurement from this time forward to the proportion of all *pregnancies* that are unintended. The new estimate of unintended pregnancy for 1998 is therefore 48 percent, or just under half of all pregnancies, based on 1998 PRAMS data and estimates of total number of pregnancies.

We do consider that the target for FY 99 of 38 percent was met, since it referred to the proportion unintended among all births, and 37.3 percent were estimated according to this criterion. But targets for FY 00 through FY 03 have been revised to reflect measurement of percent of unintended pregnancies, replacing percent of unintended births.

Population-Based Services: Children

National Performance Measure 6

The rate of birth (per 1,000) for teenagers aged 15 through 17 years

During FY 99, the objective was 30.5 births per 1,000 teenagers aged 15 through 17 years. Colorado was able to meet this goal, with a rate of 30.2 in calendar 1998, representing 2,548 births. Since 1992, the rate has dropped 17 percent overall in the age group, from a high of 36.3 births per 1,000 teens. Black teen fertility age 15-17 has dropped by 38 percent since 1991 (from 86.2 to 54.4), while the White non-Hispanic rate declined by 27 percent between 1993 and 1997 (from 21.9 to 16.0). Hispanic fertility has remained essentially unchanged in recent years, with a rate of 93.0 in 1998.

The degree to which Title V activities impact the overall teen birth rate is difficult to ascertain. There appear to be a number of factors that may be contributing to the decline in the birth rate for 15-17 year olds. The Abstinence Education Program funds local abstinence education programs in eight communities across the state. State family planning programs use Title X monies to support education and provision of contraceptives for sexually active teens. The availability of longer-acting hormonal contraceptives may make consistent use of contraceptives easier for sexually active teens. School-based health programs, using Title V monies, educate adolescents regarding sexual activity, promotion of abstinence, and pregnancy prevention; and refer sexually active teens to appropriate agencies for contraception. Fear of HIV/AIDS and HIV/AIDS education may be contributing to lower sexual activity rates. Increased use of condoms and other forms of contraception by sexually active teens and declining rates of sexual activity have been documented by the Youth Risk Behavior Study.

The level of unintended pregnancy among teenagers in Colorado is high. According to PRAMS data (1997-1998 combined years), 68 percent of teens age 15 to 19 giving birth stated that their pregnancy had been mistimed or not wanted at all. The rate of unintendedness appears to be slightly lower for Hispanic teens, who report less unintendedness in their pregnancies (65 percent, vs. 76 percent among White/non-Hispanics), but the difference is not statistically significant.

National Performance Measure 7

Percent of third grade children who have received protective sealants on at least one permanent molar tooth

During FY 99, data for screening were just beginning to be collected, and data were available for only a few counties. No target had been set for the fiscal year. Since then, however, between October 1999 and February 2000, 1,155 third grade children in the state were screened for the presence of sealants, and 28 (324) percent were found to have sealants. We are using the 28 percent as our measure for the FY 99 level.

The children screened included those living in the southern part of the state, San Luis Valley and Arkansas Valley (9 counties), a portion of Boulder County and five elementary schools in the Northeast part of the state. In addition, children of migrant and seasonal farmworkers were also screened. It is noteworthy that in this program, where sealant placement is a high priority, and despite the high turnover rate in children year to year, 31 percent of migrant third graders have sealants, a level that is better than the general population. In the Chopper Topper school-based sealant program in Metro Denver targeting second graders, 13 percent had already received sealants at the time of screening. During the program year, 84 percent of children screened received sealants and a random check indicated a 89 percent retention (sealants still intact) rate several months later, so it is anticipated these sealants will still be in place as these children become third graders.

National Performance Measure 8

The rate of deaths to children aged 1-14 caused by motor vehicle crashes per 100,000 children

The rate of deaths to children aged 1-14 caused by motor vehicle crashes was 4.3 in 1998, compared to 4.6 per 100,000 children in 1997, 5.7 in 1996, and 5.9 in 1995. The target for calendar 1998 had been set at 4.5, and this goal was met. Colorado's rate is headed downward, but it is still significantly above the Healthy People 2000 target of 3.5. A total of 36 children aged 1 to 14 died in motor vehicle crashes in 1998 in the state.

A state law effective July 1, 1995 mandated seatbelting all children ages 4 through 15 in a car. This law has been credited with the declines since 1995. Driving without a seatbelt is not a primary offense for adults, however. A Colorado State University survey in 1998 found that only 11 percent of children age 4 to 15 years were restrained when the driver did not use a seatbelt. A primary offense seatbelt law remains to be enacted in the state.

Among all children 0-14 dying in motor vehicle crashes in the 1995-1997 period, two-thirds (67 percent) were in cars driven by drivers under 21 years old. Implementation of a graduated driver's license, with some restrictions placed on young drivers age 16 and 17, did not occur in Colorado until July 1999.

State Performance Measure 3

The incidence of maltreatment of children younger than 18 (including physical abuse, sexual abuse, emotional abuse, and/or neglect)

Colorado set a target for this measure of no more than 25.2 confirmed victims of abuse per 1,000 children in FY 99, the same as the national target. The goal was met with a rate of 6.6, based on 7,010 victims among 1,064,929 children under 18 in calendar 1998. This rate appears to fluctuate slightly each year, but is widely believed to be an underestimate of the actual incidence of maltreatment.

Statistics are kept by the Central Registry of Child Protection at the Colorado Department of Human Services. They reflect only confirmed victims; about seven times as many calls are received and about four times as many cases are investigated as are determined confirmed.

State Performance Measure 4

The proportion of child care settings with access to comprehensive health and safety consultation and training

A survey conducted during FY 99 found that just under half (47 percent) of the state's child care settings had "consistent access" to comprehensive health and safety consultation and training. The FY 99 objective had been to discover the baseline level; it was met. A copy of the survey results can be found in Section 5.3, Other Supporting Documents.

Two-thirds of those surveyed responded that they utilized nursing consultation at least once during the previous 12 months. However, "consistent access" was defined as a minimum of six consultation contacts during the previous year.

Nurses interviewed as part of the survey preparation, cited a pressing need for a nurse consultation partnership with child care center providers. According to nurses, many child care center staff need more education in sick child triage, nutrition and feeding, playground safety, child abuse and neglect training, and infection control training. Most nurses prefer to deliver education at the child care site, giving them a presence at the center to develop skill-building, observation of application of training, and professional relationship with staff based on mutual trust.

State Performance Measure 5

The rate of deaths to adolescents age 15-19 caused by motor vehicle crashes per 100,000 children

The FY 99 target was set at 26.0 deaths per 100,000 teens. The 1998 vital records data show 75 deaths in this age group among 300,377 15 to 19 year-olds, yielding a rate of 25.0 deaths per 100,000 teens. The target was met for the second year in a row; the rate achieved is equal to the year 2000 target set for the state; the rate is lower than the Healthy People 2000 goal for the nation; and the rate is the lowest since at least 1980. Rates from 1993 through 1996 were all above 30 per 100,000. The sharp drop was mostly due to a large drop in motor vehicle deaths among teens age 18-19.

All our adolescent programs, as well as our child health programs, address the prevention of motor vehicle injuries. Teens are encouraged not to ride with drivers who have been drinking, not to drive after they have used alcohol, and to use seatbelts at all times. Since 1990, the percentage of alcohol-related motor vehicle crashes involving 16 to 20 year-olds has dropped to 33 percent from 50 percent. However, according to the 1999 Youth Risk Behavior Survey, seatbelt use remains at a level at which 15 percent “rarely” or “never” use seatbelts (unweighted data). Adolescent males are much less likely to use seatbelts than their female counterparts. Injury prevention is a component of both individual anticipatory guidance and of the youth-focused school and community partnership efforts. Education regarding the research related to graduated licensing programs and the relationship with reduced motor vehicle injuries was shared with legislators and advocates and resulted in the Legislature passing a graduated licensing bill in 1999.

State Performance Measure 6

The proportion of high school students reporting regular use of tobacco products
Weighted Youth Risk Behavior Survey in 1995 estimated a 22.0 percent level of use of tobacco (within the last month) among high school students. Unweighted data for 1999 show a level of 34 percent, suggesting that the target has not yet been met. This 1999 level is more than triple the 11.0 targeted for the year 2000. The survey reveals that increasing proportions of teens are smoking as well as using smokeless tobacco products (13 percent).

Title V programs addressing the health needs of children and adolescents have included tobacco prevention and cessation information for a number of years. Tobacco use, however, is widespread and not easily influenced by program interventions. Increasingly, public health providers have recognized that preventing youth from starting smoking is the most effective way to reduce teen smoking.

Colorado is one of only fourteen states that do not mandate that tobacco-use prevention be taught as part of comprehensive health education. However, the School and Community Partnership for Adolescent Health Promotion grantees all address youth tobacco use. One of the sites, Jefferson County Health Department, has a youth leadership/peer education program that focuses on tobacco. Another one is starting a school-based smoking cessation program. The other programs integrate tobacco prevention strategies into their youth programs. While the tobacco settlement legislation was not passed during the 1999 Legislative session, it did pass during the 2000 session ending in May, providing for additional dollars to address youth tobacco prevention. Colorado’s newly-formed Youth Partnership for Health, which advises CDPHE and the Department of Human Services on youth issues, is interested in helping provide leadership for youth-driven tobacco prevention strategies. The school-based health centers assess students for tobacco use, support students who have chosen not to use cigarettes and chew, and some provide cessation programs.

Population-Based Services: Children with Special Health Care Needs

There are no national or state performance measures under this heading. However, National Performance Measure 10, concerning newborn hearing screening, is a measure that impacts the work of the Health Care Program for Children with Special Needs. This measure was described on page 36.

Infrastructure Building Services: Pregnant Women, Mothers and Infants

National Performance Measure 15

Percent of very low birth weight live births

In calendar 1998, the proportion of very low birth weight births remained at 1.3 percent in Colorado, the same as in 1996 and 1997. The FY 99 target set at 1.3 percent was met. This statistic has been tracked since 1975, when it was 1.2 percent. During the late 1970's and all through the 80's the rate was held at 1.0 percent. In 1991, it reached 1.2 percent, and in 1994, it reached 1.3 percent for the first time. Colorado does not appear to be going in the correct downward direction. The Healthy People 2000 goal of 1.0 percent is not likely to be met.

Since 1975, the proportion of multiple births in the state increased from 1.9 percent to 3.1 percent, and these births appear to play a significant role in the rates of preterm and very low birth weight birth. The increase in multiple births appears to be related to an increased use of fertility drugs and assisted reproductive technologies. Colorado has one of the highest twin rates in the nation, as well as one of the highest triplet rates.

National Performance Measure 17

Percent of very low birth weight infants delivered at facilities for high-risk deliveries and neonates

A total of 60.8 percent of all very low birth weight infants were delivered at Level III facilities during calendar 1998. The goal of 65 percent in FY 99 (calendar 1998) was not met. In 1997 the proportion was 59.0 percent, while in 1996 the proportion was 61.8 percent. Colorado's 1998 rate demonstrates a certain amount of variability, and reveals that it is far from reaching the 90 percent Healthy People 2000 goal of risk appropriate care for pregnant women and infants.

Colorado has seven hospitals designated as Level III facilities, all of which are located in the immediate Denver area. In a state consisting of 104,000 square miles, where nearly half the population lives outside the greater Denver area, it is clear that delivery of these very small infants born very prematurely and unexpectedly was not assured at Level III facilities. Birth data for 1998 show that 82 percent of very low birth weight infants born to metropolitan Denver residents (Adams, Arapahoe, Boulder, Clear Creek, Denver, Douglas, Gilpin and Jefferson counties) were born in Level III hospitals, but only 32 percent of very low birth weight infants born in the other 55 counties were born in such hospitals.

The formal designation of Memorial Hospital in Colorado Springs as a Level III hospital was not accomplished in FY 99. This change is anticipated by the end of FY 00, and

would improve Colorado's percentage of very low birth weight infants born in Level III facilities to an estimated level of 72 percent.

National Performance Measure 18

Percent of infants born to pregnant women receiving prenatal care beginning in the first trimester

During 1998, 82.2 percent of all pregnant women in the state began prenatal care in the first trimester. This level falls slightly short of the target of 83.0 percent set for the state for FY 99.

The disparity among minority populations in obtaining early prenatal care has continued to improve in recent years. For white non-Hispanics in 1998, the proportion beginning care in the first trimester was 87.9 percent (approaching the 90 percent Healthy People 2000 goal); for white Hispanics it was 68.2 percent, and for Blacks it was 75.9 percent. These levels all represented improvements over levels in 1996 or earlier (see page 56). Improvement in 1997 rates, however, was not sustained in 1998.

Infrastructure Building Services: Children

National Performance Measure 12

Percent of all children in the state without health insurance

A target of 7.5 percent had been set for Colorado for FY 99, based on the state's Behavioral Risk Factor Surveillance System data which showed a level of 8.0 percent in 1998. We are unable to measure the level in the state in FY 99 because this question is not asked each year in Colorado. We do not know if the target of 7.5 percent was met or not.

We are therefore changing our data source to the American Academy of Pediatrics (AAP) estimates of uninsured children, which are available on an annual basis. According to the Academy, the percent of children in the state without health insurance was estimated to be 11.8 percent in 1998, a total of 125,290 uninsured children out of 1,064,041 under the age of 19.

The AAP 1998 percentage uninsured compares favorably, however, to the 14.1 percent in 1997 (149,000) and the 18.1 percent in 1996 (198,000), also estimated by the AAP. Colorado's Child Health Plan Plus (CHP+) began to enroll clients in 1998, and at the end of FY 98 had signed up 9,649 children. By the end of FY 99, a total enrollment of 21,289 was attained out of a total of 70,000 children estimated to be eligible for CHP+. The percent of children without health insurance in the state is anticipated to fall to lower levels in the future as these children continue to be enrolled in Colorado's CHP+ program.

National Performance Measure 13

Percent of potentially Medicaid-eligible children who have received a service paid for by the Medicaid Program

The proportion of children served in this group is estimated at 87.1 percent for FY 99, not meeting the target of 90 percent. There were 169,541 children between the ages of 1 and 21 (at least age one but under age 21) who received a paid service through the Medicaid program according to HCFA Report 416. There were an estimated 25,000 children age one or older who were potentially eligible for Medicaid, but who were not enrolled and did not receive any service. Therefore, 169,541 children were covered out of 194,541 (169,541 plus 25,000), or 87.1 percent.

This estimate for FY 99 does not take into account children who may have other insurance but who are nevertheless eligible for some Medicaid services which are not covered by that insurance. Therefore, the estimate of those served overstates the proportion actually served because the denominator (those potentially eligible) excludes this category of children.

National Performance Measure 16

The rate (per 100,000) of suicide deaths among youths age 15-19

In 1998, there were 41 suicides among Colorado teens age 15-19, yielding a rate of 13.6 per 100,000. The target for FY 99 had been set at 15.5. While the target was met, the rate increased markedly from the 10.3 experienced in 1996, and demonstrates how variable/high the rate can be. Firearms accounted for the majority (24 of 41) of the suicide deaths.

The overall decline in the rates in the 1990's, however, may be due, at least partially, to recent changes in the way mental health services are delivered to adolescents. Title V has provided funding for increasing the availability of school-based health centers, which focus heavily on mental health services to adolescents. Medicaid has shifted its payments from care in hospitals to new and expanded services emphasizing case management. MCH staff from the Child, Adolescent and School Health Section were involved in both the Governor's Commission on Suicide Prevention and in the subsequent state suicide prevention coalition, which is committed to supporting the implementation of the recommendations of the Commission's report. This is a collaborative group that has also been involved in trying to gain support for the recommendation of having dedicated staff for suicide prevention, which was passed by the legislature in May 2000. Again, suicide prevention is one of the issues targeted by all of the grantees focusing on healthy adolescents.

It should be noted that the Colorado target of 15.5 for FY 99 is well above the national target of 8.2 per 100,000.

State Performance Measure 7

The proportion of children and adolescents attending public schools who have access to research-based health education and to basic preventive and primary, physical and behavioral health services through school-based health centers

A FY 99 target for Colorado was not set, since the measure was new. Two years of data are

now available, however. In school year 97-98, the proportion was 4.3 percent. In school year 98-99, it increased to 5.7 percent.

As in a number of other states, Colorado has experienced significant growth in the numbers of school-based health centers or programs. During school year 98-99, there were 33-school-based centers serving an estimated 36,826 children and adolescents. Based upon total state enrollment of 641,206 public school students, this number indicates that almost 6 percent of public school students had access to preventive and primary, physical and behavioral health services through school-based health centers.

State Performance Measure 8

Percent of Medicaid-eligible children who receive dental services as part of their comprehensive services

In FY 99, 23.4 percent of Medicaid-eligible children received dental services, a significant increase from the 17 percent reported in FY 98. The increased percentage of 23.4 met the target of 20 percent that had been set for FY 99.

The reimbursement rates increased slightly from 65 percent (an increase from 32 percent in FY 97) to 68 percent in FY 99. In addition, the \$100,000 earmarked for supporting capital construction of a Medicaid dental clinic was utilized by opening the Smile High Dental Clinic in west Denver. This clinic is staffed by 4 dentists and utilizes 14 dental chairs, and was the 1999 recipient of the national HCFA Beneficiary Services Certificate of Merit. Despite the increase in reimbursement rates, only 12 percent of active licensed dentists in Colorado participate in Medicaid, which indicates that clinics like Smile High may be the preferred model. The Colorado Dental Association, which is actively participating in discussions on improving Medicaid access, has agreed to recruit new providing dentists once the reimbursement rate reaches 80 percent of the ADA mean for the Rocky Mountain Region. However, the Legislature did not increase its reimbursement rates either in the 1999 or the 2000 legislative session.

Infrastructure Building Services: Children with Special Health Care Needs

National Performance Measure 11

Percent of children with special health care needs in the state CSHCN Program with a source of insurance for primary and specialty care

There was no target set for this measure for FY 99, since that year was the first year of baseline data provided by the IRIS system. A total of 78 percent of children in the state's CSHCN Program (6,117 out of 7,838) were noted to have a source of insurance, although no further description of the extent of its coverage is available.

In future years the IRIS data system will provide more information about what types of insurance children have. However, we will need to do some further investigative work to determine whether the insurance coverage is adequate. Anecdotal reports show that many children are "underinsured," having insurance which does not cover their needs, especially for specialty care.

National Performance Measure 14

The degree to which the state assures family participation in program and policy activities in the state CSHCN program

For FY 99, four characteristics were “mostly met” and two factors were “completely met,” for a total score of 14 points out of 18. This year the scores were determined with input from parents on a statewide survey, from parents hired at the state and local HCP programs and from HCP multi-disciplinary team members at the state and regional levels.

Colorado continues to increase family participation in program and policy activities. Efforts in FY 99 were chiefly directed in two areas: 1) working to assure that parents were involved in state level activities, with particular emphasis on activities around the implementation of the state child health insurance plan, and 2) adding more parent participation at the regional and local level.

Carolyn Harris, HCP State Family Consultant, continues her work in training state and regional staff around family-centered care, in developing the maternal and child health block grant and in participating in discussions and decisions about HCP policy. Her continuing work on the Parent Leadership Team for the Robert Wood Johnson Covering Kids grant also led her into work with the Health Disparities Work Group of the Colorado Turning Point Initiative. Both of these have involved her in large systems- building efforts that also affect the direction and work of HCP. Carolyn has also been part of an interagency group working on the development of and training for Performance Competencies for Part C Service Coordinators and has spent much time in training the paid parents hired at the regional level HCP programs. She has been involved in a Part C physician awareness training and in developing and implementing a parent survey that is part of this years Needs Assessment. During her employment at HCP, Carolyn began and completed a Master’s Degree in Social Work and is continuing her studies in a Doctoral Program in Social Work. Her special interest in cultural competency has involved her in a number of state and national efforts in assessing interventions, social and health systems, and policy development. Carolyn, who is African-American, also joined the Advisory Council on Maternal and Child Health Programs as a parent representative.

At the regional and local levels, there was progress in parent participation. During FY 99 all thirteen regional offices hired parents as part of their multi-disciplinary teams. (This number was up from five parents in regional offices the previous year.) Parents in the regional offices report that they are active in:

- involvement with other families in writing Individual Family Services Plans (IFSPs) for Part C Service Plans
- reviewing HCP policies and written program information at the local level
- supporting new families during HCP Specialty Outreach Clinics
- providing advice on language use in brochures (Spanish language, family first language, reading level)
- providing information to local legislators
- advising staff on questions and methods for local client satisfaction surveys

- working as advocates with HMOs on the needs of families and children with special health care needs
- providing information for the Patient Advocacy Coalition on barriers and gaps in services in Medicaid and CHP+
- serving as Part C Service Coordinators.
- developing and implementing local parent support groups
- serving on local boards and advisory groups in other systems such as Part C, the Community Centered Boards, Child Find, and respite care and transportation projects, and
- training HCP staff on family centered care and inclusive environments.

Two other areas where parents are especially active in the HCP Program are in the Developmental and Evaluation Clinic system and in the system of screening and intervention for children with hearing loss. In the D & E Clinic system, it is a requirement of the contract with communities that a parent is on the evaluation and support team. Parents provide support to families during the evaluations and parent conferences as well as assist in identifying and accessing the services suggested on the D & E Plan. Parents are included in all of the training provided for staff involved in the statewide D & E system and often are asked to participate as part of the faculty.

With additional support from the Colorado Department of Education, the Colorado School for the Deaf and Blind and a grant from the Centers for Disease Control, HCP has expanded the parent participation in the screening and intervention system for children with hearing loss. Three parents, Janet DesGeorges, Wendy Alvey and Jeanine Evansted, are working in major metropolitan areas to coordinate a statewide parent organization called Family Hands and Voices. This group trains parents and professionals at local and statewide meetings about the needs and issues of concern for families and children with hearing loss. The parents serve on advisory boards in local school districts and health committees and provide information and testimony on legislative issues concerning services to children with hearing impairments.

State Performance Measure 9

The percentage complete of an integrated data system for maternal and child health programs (to improve ability to monitor and assess health needs of women and children), beginning with the Children with Special Health Care Needs program

The target set for this measure for FY 99 was 50 percent. The design and program teams estimate that half the IRIS project was completed by the end of FY 99, thus meeting this target.

The IRIS system is on track to be completed, as originally conceived, during FY 01. We will no longer report on this measure in future years, since it is being replaced by State Performance Measure 11, beginning with FY 01. The new state performance measure is described in Section III, Requirements for the Application.

State Performance Measure 10

The rate of homicides among teens 15-19 and among black male teens

The most recent data, for calendar 1998, reveal a homicide rate of 11.3 per 100,000 teens, the highest rate since 1990. The state objective for FY 99 was 6.5; the actual rate was nearly double, and the target was not met. Among black male teens, however, the rate in 1998 was 58.7, meeting the goal of 75.0 per 100,000 for the second time in the 1994-1998 period. There were four homicide deaths among black male teens in 1998 compared to six in 1997.

Title V programs address the issue of violence in families in virtually all programs. However, it is difficult to ascribe increases or decreases in the homicide rate to maternal and child health public health efforts. Homicide rates appear to be directly tied to gun violence. The homicide rate in 1998 for all teens was based on 34 deaths; 24 were due to firearms, and ten to other methods. This was an increase from the 27 deaths, 18 by firearms and nine by other methods, in 1997; and the 18 deaths, nine by firearms and nine by other methods, in 1996. It is clear that the overall increase in homicide deaths is due to an increase in firearm deaths.

All four black male teen deaths were by firearms in 1998.

The Child Fatality Review committee released a report in May 2000 detailing firearm injury deaths to 193 children under 18 between 1993 and 1997. This report contains detailed information about firearm injury deaths, the numbers of homicides, suicides, and accidents, the location of the death (own home, other home, etc.), and prevention strategies. The report is contained in Section 5.3, Other Supporting Documents.

2.5 Progress on Outcome Measures

A discussion of the progress made on each outcome measure is provided below. The guidance requests first, however, a description of the relationship between the degree to which the national and state performance measures were met in the state and their collective contributory positive impact on the outcome measures for the Title V population.

Out of 28 national and state performance measures, no targets were set for 6 (SSI children on HCP, HCP children with a medical home, HCP children with insurance, dental sealants, children with access to school-based health, and Medicaid children receiving dental services). Data were not available for the percentage of all children without health insurance, leaving 21 performance measures that could be measured. In this group, the majority (13) were met, while 8 were not met.

The 13 performance measures that were met are listed below:

- C the degree to which CSHCN pays for services (National Performance Measure 2)
- C newborn screening (National Performance Measure 4)

- C teen birth rate (National Performance Measure 6)
- C child motor vehicle deaths (National Performance Measure 8)
- C newborn hearing screening (National Performance Measure 10)
- C family participation in CSHCN (National Performance Measure 14)
- C very low birth weight births (National Performance Measure 15)
- C adolescent suicide (National Performance Measure 16)
- C unintended pregnancy (State Performance Measure 2)
- C incidence of child maltreatment (State Performance Measure 3)
- C child care health and safety consultation (State Performance Measure 4)
- C adolescent motor vehicle deaths (State Performance Measure 5)
- C integrated data system (State Performance Measure 9)

Of the 13 measures, seven have an impact on the outcome/mortality measures, specifically newborn screening, teen birth rate, child motor vehicle deaths, very low birth weight births, unintended pregnancy, incidence of child maltreatment, and child care health and safety consultation. Two (adolescent suicide and adolescent motor vehicle deaths) do not have any impact because the outcome measures are limited to children under 15. The remaining four, the degree to which CSHCN pays for services, newborn hearing screening, family participation in CSHCN, and the integrated data system, pertain more to the quality of life of children and the ability to measure access to care than they do to the outcome measures.

The state's one outcome measure, low birth weight, is impacted by three of the measures: the teen birth rate, the very low birth weight rate, and the level of unintended pregnancy.

The targets for 8 performance measures were not met in FY 99:

- C immunization rate (National Performance Measure 5)
- C breastfeeding (National Performance Measure 9)
- C services for potentially eligible Medicaid children (National Performance Measure 13)
- C percent VLBW at Level III hospitals (National Performance Measure 17)
- C first trimester prenatal care (National Performance Measure 18)
- C teen alcohol use (State Performance Measure 1)
- C teen tobacco use (State Performance Measure 6)
- C adolescent homicide rate (State Performance Measure 10)

Failure to meet the first four listed performance measures contributes to infant, neonatal, postneonatal and child mortality rates. Failure to meet the adolescent measures, however, does not impact any outcome measures, again for the simple reason that there are no adolescent outcome measures. It is important to note that the breastfeeding initiation rate was set very high (85 percent), well above the national level, and was nearly attained, while the first trimester prenatal care rate was also nearly attained (82.3 percent out of 83.0 percent).

Progress

The six outcome measures specified in this grant application do not all have targets for FY 99 (calendar 1998); targets for all begin with FY 00 (calendar 1999). Two exceptions are

infant mortality and the low birth weight rate, which have had target levels set for a number of years. Nevertheless, we can report on the levels for each of the measures.

Please note that our most recent vital statistics year is 1998. Form 12, which shows targets and data on outcome measures, uses calendar rather than fiscal year headings. (Form 11, which relates to performance measures, uses fiscal year headings). Targets are set for calendar, rather than fiscal, years, because that is the way vital statistics data are summarized.

Outcome Measure 1--*Infant Mortality Rate*: Colorado's infant mortality rate for 1998 was 6.7 deaths per 1,000 births. The state has met or exceeded the Healthy People 2000 goal (which was also the state's goal) of 7.0 since 1994. Data for 1998 confirm that Colorado has met or exceeded this goal for five straight years.

The decrease in infant mortality in recent years appears to be related to widespread educational efforts relating to sleep position as endorsed by the American Academy of Pediatrics and the Colorado SIDS Project. In calendar 1991, the SIDS death rate was 2.3 per 1,000; seven years later in 1998, it was 0.7, a level less than one-third as high.

Outcome Measure 2--*Black/White Infant Mortality Rate Disparity*: In 1998, the ratio of the Black to the White infant mortality rate was 2.4, the same as in 1997, and higher than the 1996 level of 2.3. If both Black and White national IMR goals for the year 2000 are met, the ratio would be 1.6 (11.0/7.0). The Black/White IMR ratio for Colorado is unimproved since last year.

Outcome Measure 3--*Neonatal Mortality Rate*: Colorado's neonatal mortality rate in 1998 was 4.4 deaths per 1,000 live births, down from 4.7 in 1997, and the same as the 4.4 level attained in 1996. While Colorado had not set a specific level for 1998, the year 2000 goal is 4.5. The Healthy People 2000 goal has been met in Colorado since 1992, with only one year's exception (1997).

Outcome Measure 4--*Postneonatal Mortality Rate*: The postneonatal mortality rate in 1998 was 2.3, the same as in 1997. The rate meets the national year 2000 objective of 2.5.

Outcome Measure 5--*Perinatal Mortality Rate*: The perinatal mortality rate (fetal deaths plus neonatal deaths per 1,000 live births plus fetal deaths) was 10.8 in 1998, compared to 11.5 in 1997, and 11.0 in 1996. No level had been set as a goal for 1998.

Outcome Measure 6--*Child Death Rate Age 1-14*: The child death rate was 22.2/100,000 in 1998, compared to 22.1/100,000 in 1997 and 23.1 in 1996.. No 1998 levels had been set by Colorado, but the national year 2000 goal is a level "no higher than 28/100,000," which has been achieved. The Colorado target for calendar 1999 is 23.0, and this level appears to have been met with the 1998 data.

All six outcome measures shown above measure fatalities to infants and children. In 1997, it was recognized that a mechanism was needed for the systematic review of the findings

and recommendations from Colorado's Child Fatality Review Committee, as well as from its Maternal Mortality Review Committee. In September 1998, a grant was obtained from the Maternal and Child Health Bureau to coordinate and integrate the work of the two committees as well as the work of local/regional child fatality review teams. The grant is called the Maternal, Infant and Child Mortality Review Project.

In FY 98, under the auspices of this project, the mortality review and data coordinator served on each mortality review committee (maternal, neonatal, and SIDS) in order to facilitate coordination among the groups. An examination of perinatal risk factors associated with infant mortalities was conducted by the Maternal Mortality Review Committee on cases referred by the Child Fatality Review Committee. In addition, local Child Fatality Review Committees in Denver, El Paso, La Plata, Mesa, and Pueblo counties received technical assistance from the state Child Fatality Review Committee.

In FY 99, the project developed a brief on improving death certificate reporting which was circulated to American Academy of Pediatrics members, American Academy of Family Physicians members, and the Colorado Obstetrics and Gynecology Society through their respective newsletters. The project continued to include Child Fatality Review data and prevention tips in the bimonthly Child Adolescent and School Health newsletter. The project also published a brief on firearms deaths in May 2000 and plans for a brief on drowning by the summer of 2000 were underway. A child death investigation training for southwest Colorado is to be held in July 2000 in Durango. In addition, a series of child care provider consultation trainings around the state used Child Fatality Review Committee data on injury prevention and identification of child abuse and neglect.

The Maternal Mortality Review Committee published a brief on general Colorado maternal mortality review data in June 2000.

The Project facilitated the development of two local Child Fatality Review teams in both Adams and Arapahoe County in the metro Denver area and is exploring a local team in Morgan County in northeast Colorado. The Child Fatality Review Committee website was established in December 1999, and can be accessed at <http://www.cdphe.state.co.us/pp/cfrc/cfrchom.asp>.

In summary regarding the outcome objectives, four of the six Healthy People 2000 outcome goals have been met by Colorado (infant mortality, neonatal mortality, postneonatal mortality, and the child death rate.) The perinatal mortality rate may have reached the lowest level in 1998 that it has attained in recent years (while no goal was set), but the Black/White IMR disparity is not improving.

State Outcome Measure--Low Birth Weight Rate: In 1995, we set our 1998, 1999, and 2000 goal at a 7.0 percent low birth weight rate, acknowledging that the Healthy People 2000 goal of 5.0 percent for the nation was beyond our immediate reach. In 1995, the state's low birth weight rate was 8.5 percent, having increased from 8.0 percent in 1990, and from 7.6 percent in 1984 (the lowest level ever achieved). The rate increased sharply

to 8.9 percent in 1996, the highest level in over 20 years. In 1997, the rate remained at 8.9 percent, but in 1998 the rate dropped slightly to 8.7 percent.

Colorado's low birth weight rate has been the subject of vital concern to the state health department for many years. Colorado has had one of the highest rates in the nation for at least fifty years, and even as the nation's rate has risen in the past ten years, Colorado's rate has risen higher. In 1998 the Women's Health Section launched an in-depth study with the Health Statistics Division to determine the largest contributors to Colorado's rate. A report was issued in June 2000, describing the population attributable risks associated with a variety of factors. This report is included in the Supporting Documents section, and it is also accessible on the Internet at <http://www.cdph.state.co.us/fc/lbwreport.asp>.

In brief, the report finds that inadequate weight gain and smoking among pregnant women are the two highest contributors to the low birth weight rate among singleton births. If every pregnant woman gained an adequate amount of weight, and no pregnant woman smoked, the state's singleton low birth weight rate could be reduced by at least one-third, and the state's overall low birth weight rate could be reduced by at least one-quarter, *to a level of 6.4 percent*. In addition, the report found that about half a percentage point of the state's total low birth weight rate was due to excess multiple births attributed to assisted reproduction.

The report determined that if four remediable factors were addressed fully, reducing rapid repeat pregnancies and providing first trimester prenatal care to all pregnant women in addition to eliminating smoking and inadequate weight gain, and if multiple births could be reduced to a naturally occurring level, the state's low birth weight rate could fall to 5.1 percent, nearly meeting the Healthy People 2000 and 2010 goal of 5 percent.

The report provides numerous interventions and strategies to address the factors that play such large roles in Colorado's low birth weight problem. Widespread adoption of these ideas by health care providers, policymakers, patients and payors will lead to real reductions in the state's low birth weight rate. In the upcoming months and years, the Colorado Department of Public Health and Environment intends to promote the report and assist the provider community in implementing the strategies that have proven successful in the state's Prenatal Plus enhanced care program, as well as other strategies used elsewhere. The speed with which these ideas are put into practice across the state will greatly influence the rate of decline in the low birth weight rate.

III. REQUIREMENTS FOR APPLICATION

3.1 Needs Assessment of the Maternal and Child Health Population

This section of the application contains the Year 2000 Needs Assessment of the maternal and child health population. It describes the emerging needs of the population and the changes in the larger health care system which have occurred since the last Needs Assessment was done in 1995. It identifies the need for preventive and primary care services for pregnant women, mothers, and infants; preventive and primary care services for children, including adolescents; and services for children with special health care needs. The process of conducting the needs assessment is described, an overview of the Health Status of the population is included, and the needs of the population are detailed according to the type of services required, i.e. direct health care, enabling, population-based, and infrastructure-building.

3.1.1 Needs Assessment Process

The statewide Needs Assessment was carried out in the context of a larger effort to “reinvent” the state’s Maternal and Child Health Program, which emphasized the importance of building the state and local infrastructure to implement an ongoing assessment and planning cycle. A new MCH funding methodology and planning process was implemented in FY 00, which asked each county public health department to develop an annual or multi-year MCH County Plan, based on an assessment of the needs of the women and children and of the resources of the community. Each of the fourteen county health departments assessed and reported the needs and resources by the four levels of the MCH pyramid, i.e. direct care, enabling, population-based and infrastructure-building services. The agencies then described the objectives and activities which they plan to employ to address the prioritized needs in FY 01, and in FY 02 and FY 03 (if presenting a multi-year plan). The thirty-nine county public health nursing services will be implementing the new assessment and planning process in FY 01.

To support the local agencies in the development of their county MCH Plans, county MCH data sets were developed by the Family and Community Health Services Division, providing county or region-specific data and rates for the MCH Performance and Outcome Measures wherever possible. These data sets were presented to the local agencies at regional MCH planning meetings held throughout the state in February 2000, along with guidance and tools that could be used in the development of the county MCH plans. Additional sources of data were recommended, including the Statewide Marketplace Analysis prepared by the Colorado Community Health Network, Colorado’s Primary Care Association, and the Uniform Data System Reports prepared by the community health centers for the Bureau of Primary Care. Local agencies also used various needs assessments they had conducted with their communities. Technical assistance in interpreting the data was made available through the MCH Information Specialist who assisted our MCH demographer in the development of the county MCH data sets. Additional technical assistance in community-based needs assessment and planning processes was also made available.

The local public health agencies were a major source of information for the statewide needs assessment, drawing from preliminary MCH plans submitted in December 1999 and from the County MCH Plans submitted in May 2000 by the health departments. The regional MCH planning meetings also provided an opportunity to conduct focus groups, obtaining input from all the local public health agencies regarding the emerging issues.

Qualitative information about systems of care for children with special needs was obtained from every county from questions on the annual HCP Report. Each county described barriers and gaps in service delivery in CHP+ , nutrition services, occupational and physical therapy, newborn hearing screening, and mental health. The counties commented on parent leadership and involvement in policy development for the Children with Special Health Care Needs population in their counties. They described the need for outreach clinic services and what collaborative efforts with health, education, social service and support agencies were available at the community level. The information provided is summarized in Section 5.3, Other Supporting Documents, entitled “Summary of Current Issues for Children with Special Health Care Needs in Colorado.”

In addition, the Center for Human Investment Policy of the University of Colorado at Denver was engaged to provide information from additional sources, including parents, child care providers, educators, policymakers, academicians, and child advocates. The Center staff drew from the results of a variety of initiatives carried out in the state in recent years, including regional forums, focus groups, and key informant surveys on early intervention services, quality child care services, and emerging health issues. Priority issues that were identified included access to dental care and to mental health services. These issues were consistent with the issues identified by the local public health agency personnel at the February regional MCH meetings. The Center also interviewed key informants concerning childhood obesity, with particular attention to disparities among racial and ethnic groups, as this has been identified at the national and state levels as an emerging issues.

The information from the regional MCH planning meetings and from the county MCH plans was synthesized by the state with the information derived from the focus groups, with the information from the Center for Human Investment Policy on emerging health issues, and with the information from the county annual HCP Reports. In addition, an analysis was undertaken of the progress Colorado has made or not made to date evidenced by the MCH Performance and Outcome Measures. Next, an analysis of the Health Status of the Maternal and Child Health Population (pages 55 to 79) was prepared by the Family and Community Health Services Division, with analysis of disparities by major racial/ethnic groups. This information and appropriate reports were provided to the state Advisory Council on Health Programs for Women and Children which finalized its recommendations for the state’s MCH priorities and state-chosen performance measures in June 2000.

The Advisory Council on Health Programs for Women and Children was an invaluable source of input and advice to the state in determining the priorities and measures to be used for the plan for the FY 01. The Advisory Council includes representation from key state public agencies, i.e. education, human services, developmental disabilities, Medicaid and health policy as well as the Primary Care Association. The private professional organizations, i.e. the Colorado Chapter of

the American Academy of Pediatricians, the Colorado Academy of Family Practice Physicians, and the Colorado Medical Society are also represented and actively participated. New members to the Council this year were two consumer representatives, both parents of children with special needs.

In FY 01 the state staff and the Advisory Council will use the comprehensive needs assessment to refine the MCH priorities and state-chosen measures to be responsive to the identified needs and to develop programmatic interventions, where appropriate. The Council and the state staff will also use the comprehensive needs assessment to determine where to direct the discretionary MCH funds which are distributed to community agencies through a competitive bid process.

Limitations of the data include the issue of small numbers for local health agencies with relatively small populations for many of the MCH Performance Measures. The need to obtain community or small area data for the more heavily populated counties is another challenge which both the state and the larger county public health departments are working on.

The focus of Colorado's work to improve its assessment and planning process in conducting the five-year MCH needs assessment has been on strengthening the collaborative partnership in this effort between the state and local public health agencies. This focus includes establishing an ongoing cycle of reassessment and planning based at the community level and informing the statewide assessment and planning effort. Addressing the identified priority needs through this state and local partnership should contribute, over time, to meeting the MCH Performance Measures and improving the health status of women and children as measured by the Outcome Measures and the MCH Health Status Indicators.

The Oral Health Program is seeking technical assistance in sampling technique for a statewide screening of K-3 children as part of the state's contribution to the National Oral Health Surveillance System.

3.1.2 Needs Assessment Content

An overview of the health status of the maternal and child health population is contained in Section 3.1.2.1, from page 55 to page 79. The direct, enabling, population-based and infrastructure-building service needs for the maternal and child health populations follow, and are described in sections 3.1.2.2 through 3.1.2.5, first beginning on page 80.

3.1.2.1 Overview of the Maternal and Child Health Population Status

The problems described in this section constitute the major issues facing Colorado today in the state's maternal and child health population. While the group as a whole is young and healthy, there are many areas of concern, from the problems associated with low birth weight, and the lack of immunization among children, to the incidence of injuries among adolescents. The concern is sharpened as well by obvious health disparities among racial/ethnic groups, primarily signifying differential access to health care, and sometimes revealing patterns based on socioeconomic differences.

The structure of the discussion in this part of the Needs Assessment follows the natural progression of age from the prenatal environment through birth, infancy, and childhood to youth and adolescence. These sections are titled *Pregnancy and Prenatal Care*, *Birth and Infancy*, *Children*, and *Adolescents*. Relevant problems are described in each section, data since 1990 are presented in graphs, trends are described, racial and ethnic disparities are highlighted, and the levels of the indicators are compared to the Healthy People 2000 goals for the nation.¹ Some county maps for Colorado are also included, so that geographic differences can be shown.

Detailed year-to-year data and rates used to develop the charts and maps are provided in Section 5.3, Other Supporting Documents, at the end of the application. Additional population information is available on Form D2 as well.

This overview does not focus on just the most recent five years. Trend analysis is more appropriate over a longer time period, and changes in racial and ethnic disparities are more evident when evaluated over more years as well. Therefore, most issues are presented with data for 1990 through 1998. Numerous issues are important, but the discussion of each is necessarily brief. For further information, please contact the Family and Community Health Services Division of the Colorado Department of Public Health & Environment. For individual county data, information is available on a number of topics in the Maternal and Child Health County Data Sets provided on the Department's website (<http://www.cdphe.state.co.us/fc/mchdatasets/mchdatahom.asp>). Some examples of the county data available are also contained in Section 5.3, Other Supporting Documents.²

Pregnancy and Prenatal Care

The following topics are covered in this section: trimester prenatal care began, unintended pregnancy, folic acid, inadequate weight gain, smoking, and maternal mortality.

The best prognosis for a healthy baby begins with a mother who is healthy prior to conception, who wants to become pregnant, who does not smoke or drink, who lives in a supportive environment, who seeks care early in pregnancy, and who has adequate resources to support her physical, material, and emotional health. Approximately half of all women giving birth in a year

¹ The website for Healthy People 2000 is <http://odphp.osophs.dhhs.gov/pubs/hp2000/>.

² Data are provided, when available, for counties or groups of counties for each of the national and state MCH performance and outcome measures. Some measures for which county data are available are topics discussed in this section, such as prenatal care, low birth weight, infant mortality, motor vehicle death, and suicide.

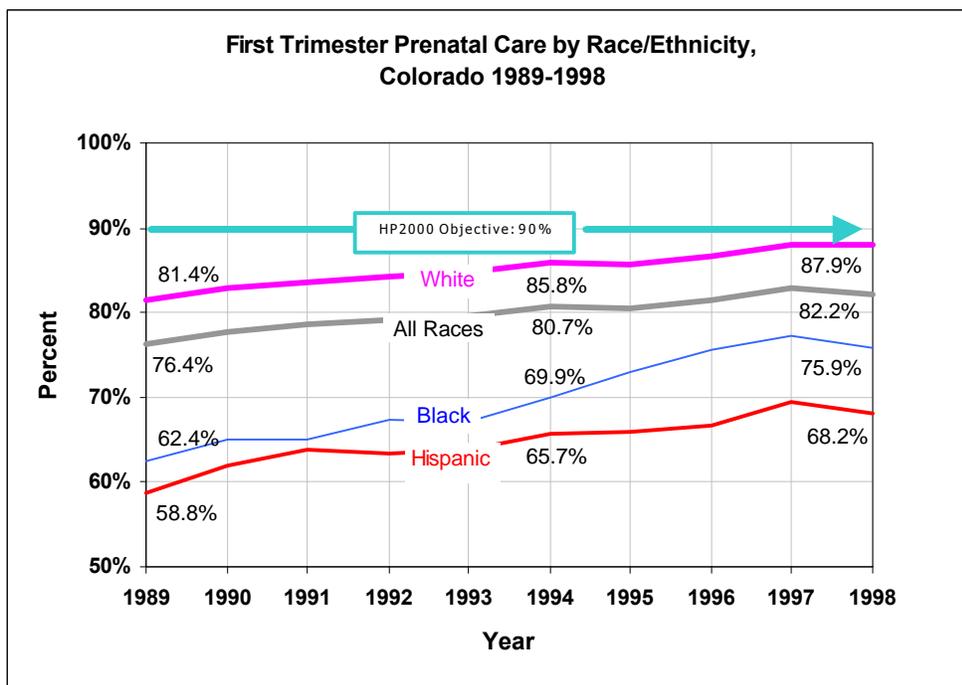
fit this description. Problems may arise within this group, but are more likely to be associated with pregnant women who are not in this category.

Trimester Prenatal Care Began

Obtaining care early in pregnancy, during the first trimester, is a marker both for access to care and pregnancy intention. The state statistics for first trimester care have shown steady improvement over the last ten years, rising from 76.4 percent of all women obtaining first trimester care in 1989 to 82.2 percent in 1998, an increase of nearly six percentage points. Undoubtedly, the passage of the 1989 Omnibus Budget Reconciliation Act, assuring Medicaid coverage to women up to 133 percent of the federal poverty level (Colorado’s level), played a significant role in the proportion of women obtaining first trimester care, which had changed little throughout the 1980’s. Despite the improvement during the 1990’s, Colorado’s first trimester care rate still fell short of the Healthy People 2000 objective of 90 percent.

Figure 1 illustrates that improvement during the decade of the 1990’s took place in all racial/ethnic groups.³ Among white non-Hispanics, the level improved by six percentage points; among black women, the level improved by 13 percentage points; among Hispanics, the level improved by 10 percentage points. Greater progress was made among women of color than among white non-Hispanic women, highlighting the role of increased Medicaid coverage for minority groups who are often at lower socioeconomic levels.

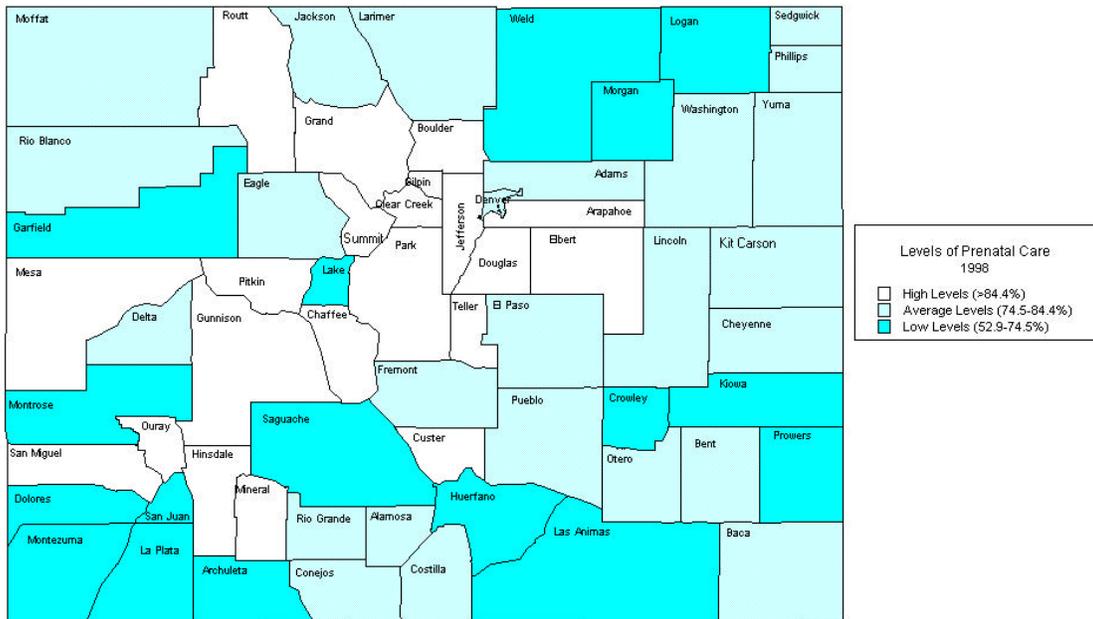
Figure 1.



³ In this and all subsequent charts in this section, the label White refers to white non-Hispanic. The label, “All Races,” refers to the total population. It includes races not specified in the figure, i.e., Asian, Native American, etc.

Nonetheless, in 1998, the picture of first trimester care in terms of racial and ethnic disparities looks similar to the picture ten years before. All the levels are higher, and the differences among the rates are less extreme, but each racial/ethnic group has improved only in degree and not in relative status. It is worth noting, however, that white non-Hispanic women have almost reached the Healthy People 2000 goal of 90 percent, with a level of 87.9 percent.

Map A. Percent Initiating Prenatal Care during the First Trimester, 1998



The pattern of initiation of prenatal care across the state suggests that access among counties close to Denver is relatively high, and some mountain communities appear to attain high levels as well (Map A). Low levels are found in some of the southern counties, as well as in Weld, Logan, and Morgan counties in the northeast, in Garfield to the west, and in Crowley, Kiowa, and Prowers to the southeast. A large proportion (38 percent) of births in the counties that have low rates are Hispanic; late care among this population group appears to play a substantial role in reducing the overall county rates of first trimester care.

Unintended Pregnancy

According to the 1997-1998 PRAMS survey,⁴ 39 percent of all pregnancies that ended in live births were unintended at the time of conception. The term unintended is used when the mother states that she wanted to be pregnant later, or did not want to be pregnant then or at any time in the future. Blacks reported the highest level of unintendedness at 61 percent, while Hispanics were at 44 percent and white non-Hispanics at 36 percent. Figure 2 highlights these differences. The Hispanic level is more than 20 percent higher than the white non-Hispanic level, and the black level is nearly 70 percent higher. Unintended pregnancy is a significant problem regardless of race, and is a factor in a majority of black pregnancies.

Figure 2.

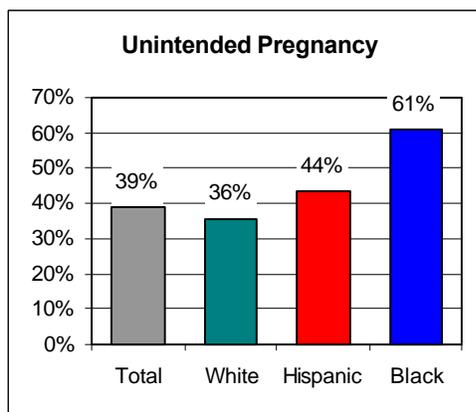
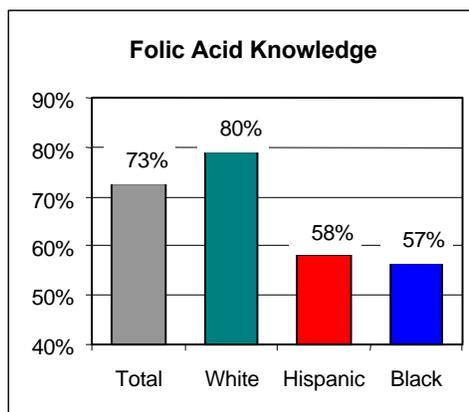


Figure 3.



Folic Acid

As Figure 3 illustrates, the knowledge that taking folic acid can prevent some birth defects is fairly high among Colorado women who recently gave birth, at nearly 73 percent according to the 1997-1998 PRAMS data. Knowledge was highest among white non-Hispanic women at 80 percent, but considerably lower for Hispanic and black women at 58 percent and 57 percent, respectively. Colorado data for 1993-1995 show a neural tube defects rate of 4.0 per 10,000 live births for non-Hispanic whites, 4.9 for Hispanics, and 2.5 for blacks.

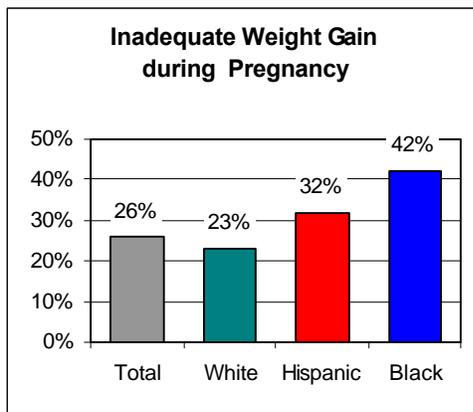
A Folic Acid Task Force was created in the spring of 1998 to inform women of childbearing age about folic acid. The work of this group includes distribution of information about the value of taking folic acid, educational presentations, funding of free folic acid for recurrence prevention, and many other activities. The Task Force feels that there is an urgent need to raise awareness so that neural tube defects can be prevented; the Healthy People 2010 goal is that 80 percent of women of childbearing age take adequate folic acid supplements.

⁴ PRAMS (Pregnancy Risk Assessment Monitoring System) is an ongoing population-based monthly random sample survey of Colorado mothers who have recently given birth; twenty other states also conduct PRAMS surveys. Data from the Colorado PRAMS survey supplement birth certificate information, and results are weighted to be representative of all Colorado births. PRAMS was begun in Colorado in 1997. Data for 1997 and 1998 have been combined in some instances.

Inadequate Weight Gain

Inadequate maternal weight gain during pregnancy is the single most important factor contributing to Colorado's low birth weight problem among singleton births, according to the Colorado Department of Public Health & Environment's recently released report, *Tipping the Scales: Weighing in on Solutions to the Low Birth Weight Problem in Colorado*, written by the Family and Community Health Services Division and the Health Statistics Section.⁵ One out of every four Colorado women does not gain an adequate amount of weight during pregnancy (for a term delivery, a woman should gain at least 28 pounds). PRAMS data for 1997-1998 (Figure 4) show that white non-Hispanic women have the lowest prevalence of inadequate weight gain (23 percent), compared to Hispanic women (32 percent) and black women (42 percent).

Figure 4.

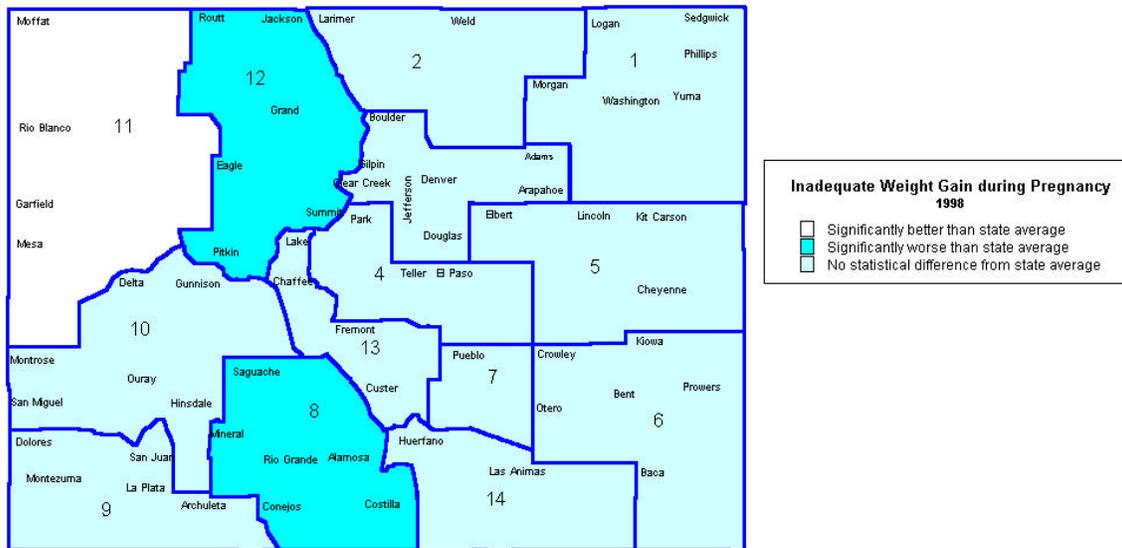


Map B shows the geographic pattern of weight gain inadequacy across the state. In this map, data are calculated for regions (groups of counties), not for individual counties. The San Luis Valley (Region 8) in the south and the mountain counties of Eagle, Grand, Jackson, Pitkin, Routt, and Summit (Region 12) in the north show statistically significantly higher percentages of pregnant women gaining weight inadequately than the state average. Region 8 has 44 percent (+/- 10 percent) of its pregnant women not gaining enough weight, while Region 12 has 34 percent (+/- 6 percent) not gaining adequately. The northwest part of the state, however, Region 11, containing Mesa, Garfield, Moffat, and Rio Blanco, shows a significantly lower inadequate weight gain rate of only 19 percent (+/- 7 percent).

Inadequate weight gain is a readily modifiable risk. Appropriate nutritional counseling during pregnancy is increasingly recognized as critical for the pregnant mother to ensure adequate weight gain.

⁵ The complete text of the report is contained in Section 5.3, Other Supporting Documents. It can also be found at <http://www.cdphe.state.co.us/fc/lbwreport.asp>.

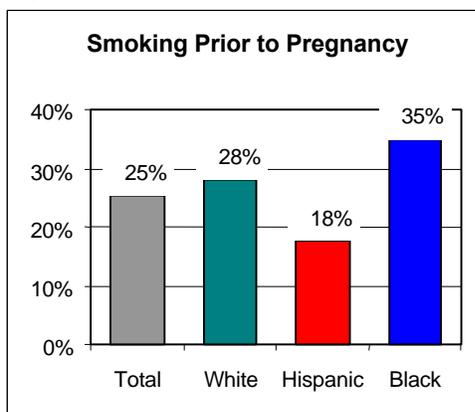
Map B. Inadequate Weight Gain during Pregnancy, 1998



Smoking

Prenatal maternal use of tobacco is associated with an increased risk of delivering a low birth weight newborn. According to the 1997-1998 PRAMS survey, 25 percent of all women who recently gave birth had reported smoking three months prior to their pregnancy. As Figure 5 shows, there were some disparities observed for this measure when race was examined. Black women reported the highest level of smoking at 35 percent while Hispanic women reported the lowest level of smoking at 18 percent. Twenty-eight percent of white non-Hispanic women reported smoking three months prior to pregnancy. The black level of smoking is 25 percent higher than the white non-Hispanic level, while the Hispanic level is only 64 percent of the white non-Hispanic level.

Figure 5.



Smoking during pregnancy was found to be the second leading cause of low weight birth among singleton births in the *Tipping the Scales* report cited above. Women who become pregnant who are smokers should quit smoking; reducing the number of cigarettes smoked is not an effective solution.

Maternal Mortality

The state Maternal Mortality Review Committee found a total of 50 maternal deaths between 1990 and 1997 in Colorado, yielding a rate of 11.4 maternal deaths per 100,000 live births.⁶ The maternal death ratio increases with maternal age, and the ratio for black mothers is three times the number for whites (31.5 vs. 10.0). The Healthy People 2000 goal is set at 3.3 deaths.

The Committee's recommended prevention strategies include provider and patient education, advocacy regarding systems issues, and the need to increase awareness of available resources to facilitate appropriate referral. The *Maternal Mortality in Colorado: 1990-1997* brief suggests that one-half of all maternal deaths are preventable. The brief is included in Section 5.3, Other Supporting Documents.

Summary for Pregnancy and Prenatal Care

The problems discussed in this section are the most serious among those that are typically included under Pregnancy and Prenatal Care. The availability of PRAMS data has greatly increased our knowledge of problems in Colorado on these topics in the past two years, in addition to our use of standard birth certificate data. The Maternal Mortality Review data also provide new insight into the picture of Colorado's problem.

On the whole, there has been an improvement in the availability of prenatal care in recent years, but the substance of that care, specifically attention to smoking cessation and weight gain, in addition to addressing the high level of unintended pregnancy, provides the opportunity for progress in the decade ahead. In addition, progress in reducing maternal mortality rests on improved provider education, particularly around referral.

Birth and Infancy

An examination of levels and trends in recent years regarding low birth weight, infant mortality, Sudden Infant Death Syndrome (SIDS), and breastfeeding is presented in this section.

Low Birth Weight

The level of low birth weight in Colorado is high, with 8.7 percent of all births weighing less than 2500 grams (5 pounds, 8 ounces, or less) in 1998, making the state's rate one of the highest in the nation.* The state rate is well above the Healthy People 2000 objective of 5.0 percent and has been increasing for over a decade.

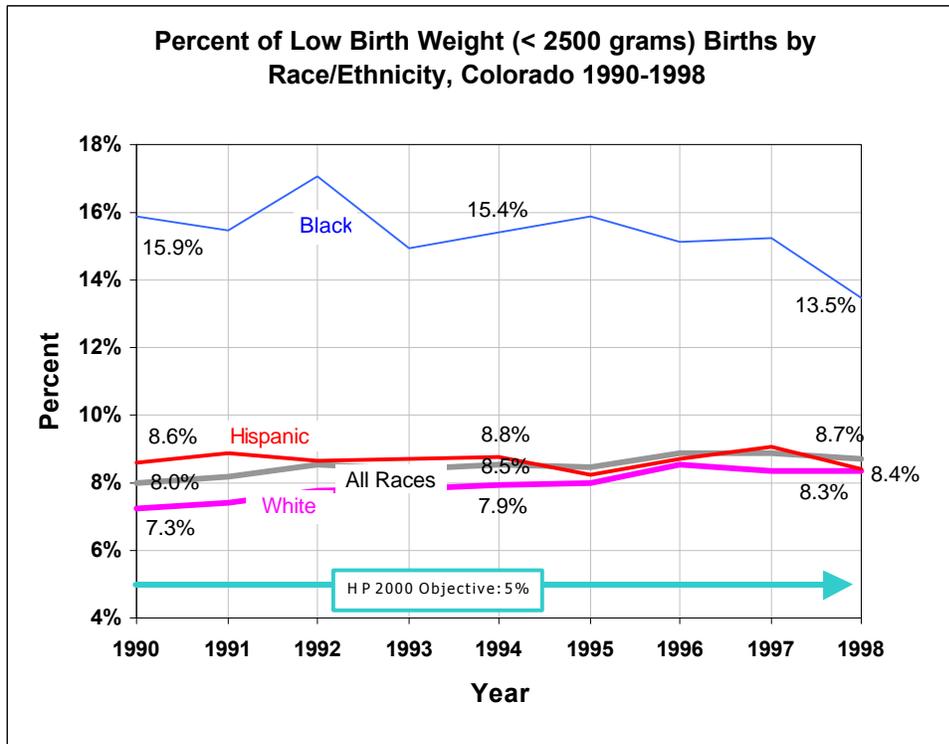
As Figure 6 shows, all racial and ethnic groups are above the Healthy People objective of 5 percent for the year 2000. The 1998 rate of 8.7 percent for all races shows a 9 percent increase from the 1990 rate of 8.0 percent. The rate for white non-Hispanic women has increased 14 percent during this period while the Hispanic rate has not shown any clear trend, with both increases and decreases over the past decade between 8.6 percent in 1990 and 8.4 percent in 1998. The rate for blacks has shown an overall decline of 15 percent from 1990 to 1998, falling

⁶ Using only death certificate information, maternal mortality is 7.1; the higher ratio makes use of extensive linking between birth and death certificates to identify more cases. In addition, cases are tabulated if the death occurs within one year (instead of 42 days postpartum) of the termination of pregnancy.

* High altitude plays a role in determining the level of Colorado's low birth weight rate. However, other factors are more important and are amenable to intervention. See the *Tipping the Scales* report.

from 15.9 percent in 1990 to 13.5 percent in 1998. However, the low birth weight rate for blacks is still 55 percent higher than the rate for white non-Hispanics.

Figure 6.



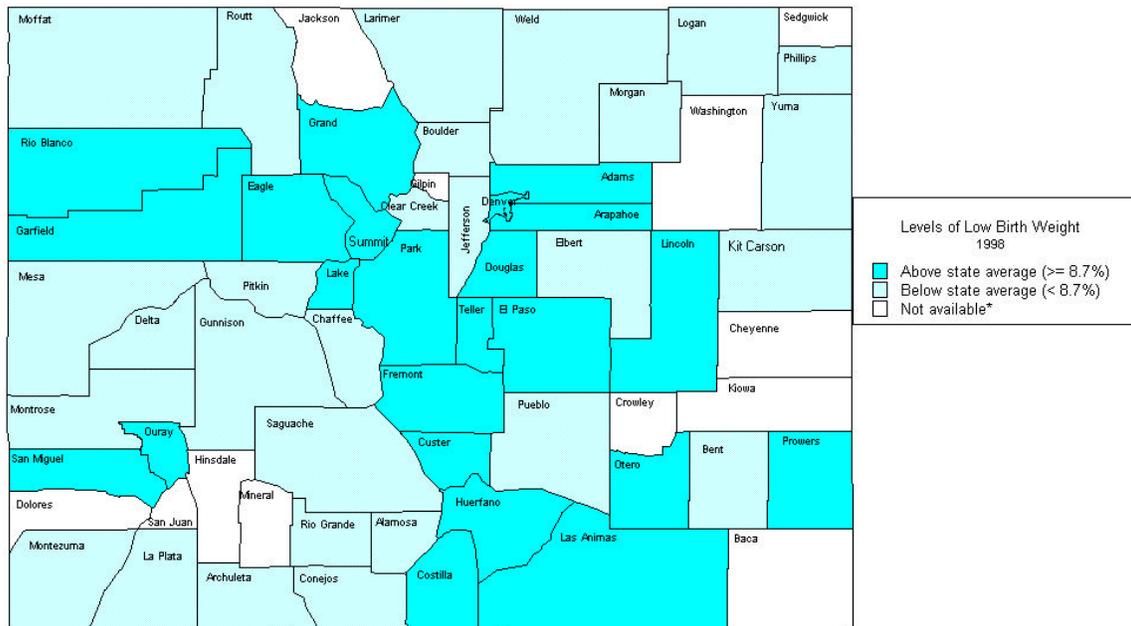
The report, *Tipping the Scales: Weighing in on Solutions to the Low Birth Weight Problem in Colorado*, examines the problem of low birth weight in Colorado in detail. The report is recommended reading as an analysis of current thinking in the state about low weight birth because it provides not only a population attributable risk analysis, estimating how many low weight births are attributable to each of different causes, but also an array of recommendations and solutions. It is available in Section 5.3, and can also be found at <http://www.cdphe.state.co.us/fc/lbwreport.asp>.

The report indicates that although the increasing proportion of multiple births is a major contributor to the overall rate, the two behavioral risks of inadequate weight gain during pregnancy and smoking during pregnancy appear to be the most important factors in low birth weight among Colorado’s singleton births. The report estimates as well that the state low birth weight rate could be reduced to 5.1 percent (from 8.7 percent) if all pregnant women gained weight adequately; no pregnant women smoked; all women received first trimester care; all women experiencing repeat pregnancies had an interval of at least 12 months between delivery and subsequent conception; and multiple births were reduced to a naturally occurring level (assisted reproductive technology would no longer contribute to an elevated level).

Map C shows the pattern of low birth weight across the state. A total of twelve counties had rates of low birth rate that were based on values of 0, 1 or 2 so could not be mapped below.

Twenty-eight counties have rates lower than the state 8.7 percent average. There was only one county (Bent) among these that had a low birth weight rate below 5 percent, meeting the Healthy People objective. The remaining 23 counties' rates are equal to or greater than the state average, and nine have especially high rates of at least 10.0 percent or more. The counties with high rates include Ouray and San Miguel in the southwest, Grand in the north, Lake, Park, and Teller in the center of the state, Lincoln to the east, and Custer and Costilla to the south.

Map C. Percent of Low Birth Weight Births, 1998



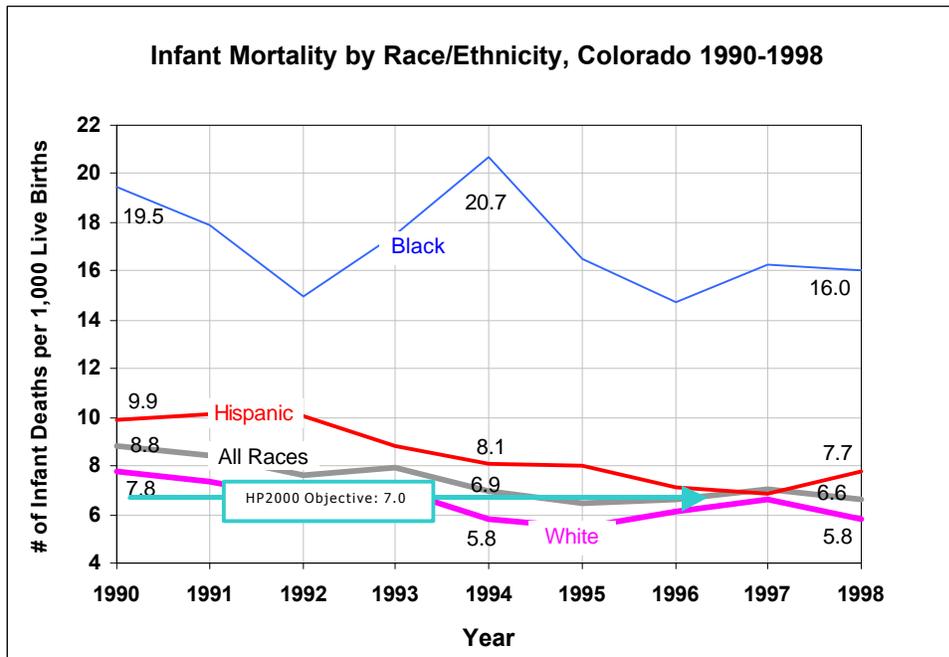
* Rates are not calculated when there are less than 3 events.

In the 2000 PRAMS survey, Colorado has added two oral health questions asking about dental care needed/received during pregnancy and how long it has been since their teeth were cleaned. With the emerging research linking periodontal disease to preterm low birth weight babies, it is anticipated that analysis of these questions will provide impetus for health education and treatment interventions.

Infant Mortality Rate

The infant mortality rate in Colorado has been decreasing over the past decade. Since 1990, the infant mortality rate observed for all live births decreased 25 percent from 8.8 deaths per 1,000 births to 6.6 in 1998. As shown in Figure 7, all racial and ethnic groups did not share in this reduction to the same degree, but the trend for all groups has been a decrease in recent years.

Figure 7.



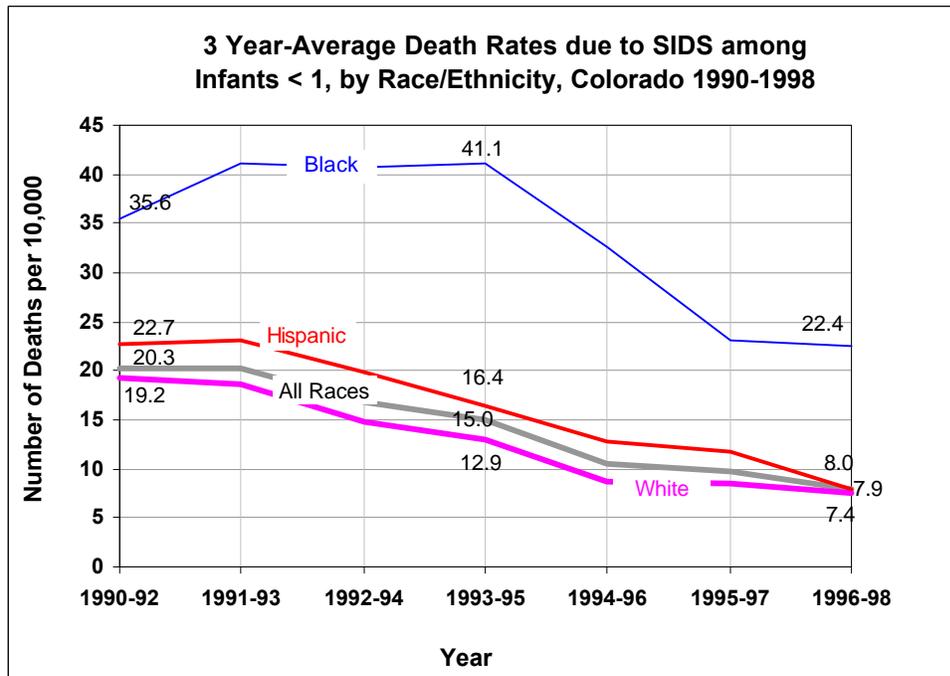
Colorado has met the Healthy People 2000 objective of 7.0 infant deaths per 1,000 live births since 1994 for all infants, but not for all racial and ethnic groups. Except for 1997, when the Hispanic infant mortality rate dipped to 6.9, neither Hispanic nor black infant mortality rates have declined to the year 2000 objective of 7.0. The black infant mortality rate in 1998 was 2.75 times higher than the infant mortality rate for white non-Hispanics. The national objective for black infant mortality rate was 11.0; Colorado's rate of 16.0 in 1998 remains very high.

Sudden Infant Death Syndrome (SIDS)

As in the United States, SIDS is one of the leading causes of infant death in Colorado. During the past decade, however, the Colorado SIDS death rate declined significantly, from 20.3 deaths per 10,000 births in 1990 to 7.9 in 1998. In 1998, 41 Colorado infant deaths were attributed to SIDS.

As shown in Figure 8, black infants experience nearly two to three times the rate of SIDS than white non-Hispanic infants. The three-year average SIDS rate for blacks from 1996-98 was 22.4 per 10,000 births, a rate which was three times higher than the rate of 7.4 for white non-Hispanic infants during this period. This striking difference is not observed between white non-Hispanic and Hispanic infants. During 1996-1998, the Hispanic rate was 8.0.

Figure 8.



Interestingly, the 1997-1998 PRAMS survey data show (Figure 9) **Figure 9.**

that black mothers were least likely to report putting their infants to sleep on their backs. Sleeping prone (on stomach) has consistently been associated with a higher risk of SIDS. Only 25 percent of black mothers responded that they put their infants to sleep on their backs, compared to 60 percent of white non-Hispanic mothers and 48 percent of Hispanic mothers.

Dissemination of information about the relationship between sleeping position and the risk of SIDS continues to be the most obvious solution to the problem. Education of parents and grandparents should lead to continued reduction in SIDS and subsequently in the infant mortality rate.

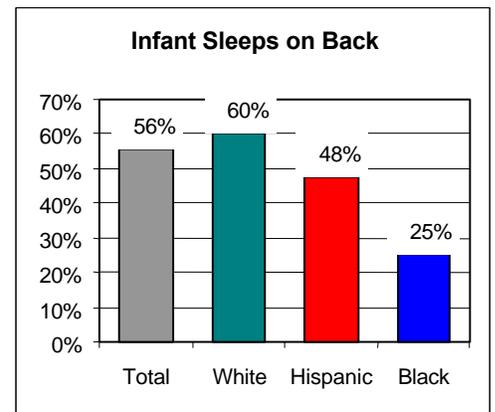
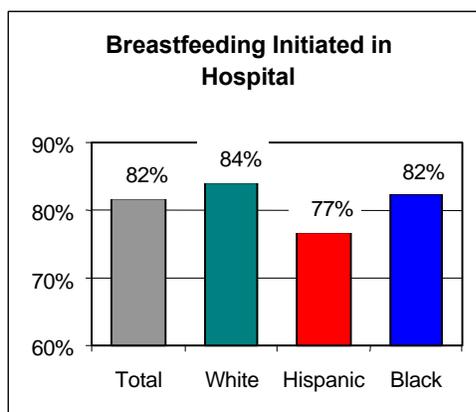


Figure 10.



Breastfeeding

Breastfeeding has been shown to be an effective means of lowering mortality and morbidity among infants. As the 1997-1998 PRAMS results show in Figure 10, the breastfeeding initiation rate for all mothers upon hospital discharge was 82 percent, well above the Healthy People 2000 goal of 75 percent and the national average of 64 percent. Rates for white non-Hispanic and black mothers were very similar at 84 percent and 82 percent, respectively. Hispanic mothers had a lower rate of

breastfeeding initiation at 77 percent. PRAMS data from 1997 indicate that breastfeeding continuation rates after nine weeks dropped to 70 percent among white non-Hispanic women, to 54 percent among Hispanic women, and to 54 percent among other races (black, Asian, and other).

Summary for Birth and Infancy

Two opposite trends affecting infants have taken place in recent years: a decrease in the infant mortality rate and an increase in the low birth weight rate. These trends have occurred as more and more very small babies benefit from neonatal intensive care, with death a less frequent outcome than previously. In addition, the understanding that sleep position was a critical factor in the incidence of SIDS led to widespread public health efforts to educate new parents, beginning in 1992 with the American Academy of Pediatrics recommendation of the back position. These efforts have contributed to much of the decline in the infant mortality rate during the decade.

Also during the 1990's, there has been a substantial increase in the frequency of breastfeeding. At the beginning of the decade, 69 percent of Colorado women (according to Ross Mothers' Survey data) initiated breastfeeding. Colorado has been a leader in breastfeeding promotion, achieving substantial success throughout the decade. The challenge remains to increase the length of time that mothers breastfeed so that the Healthy People 2000 goal of 50 percent still breastfeeding at six months can be achieved.

Children

An examination of levels and trends in immunizations, asthma, death rates, and leading causes of death is presented in this section.

Immunizations

The level of immunizations for infants and young children reflects the success within the state in protecting its most vulnerable citizens against serious and potentially fatal diseases. Since 1992, Colorado's proportion of two-year olds immunized ranged between 73 and 77 percent (for the 4:3:1:3 series), while the Healthy People 2000 goal was set at 90 percent. The higher rates were achieved in the mid-1990's, when increased funding for immunization efforts was available. Rates in the five years prior to 1992 ranged between 57 percent and 63 percent.

Colorado's failure to meet the 90 percent goal by 1998 is primarily due to failure to administer the 4th DTap. Recommendations to providers for improvement are focused on reminder and recall activities. Immunizations are a top priority of the Colorado Department of Public Health & Environment and improvements in the state's immunization rates should occur in the next decade with widespread implementation of the recommendations.

Asthma

Asthma is one of the most common chronic diseases in the United States. Data are available for hospitalizations for children in Colorado ages 0 to 4 for the years 1990 through 1998. If asthma is properly managed, as it would be with appropriate ongoing medical care, hospitalization should not occur with any frequency. Asthma hospitalization data are regarded, therefore, as a measure of access to appropriate health care. Colorado's rates vary from year to year, beginning

with 52.2 per 10,000 children in 1990, and ending with 51.3 in 1998, with a low of 45.1 in 1994 and a high of 61.1 in 1997. The rate of hospitalization does not appear to have increased in this decade for young Colorado children, suggesting that access to medical care for young children, at least by this measure, is variable but not worsening.

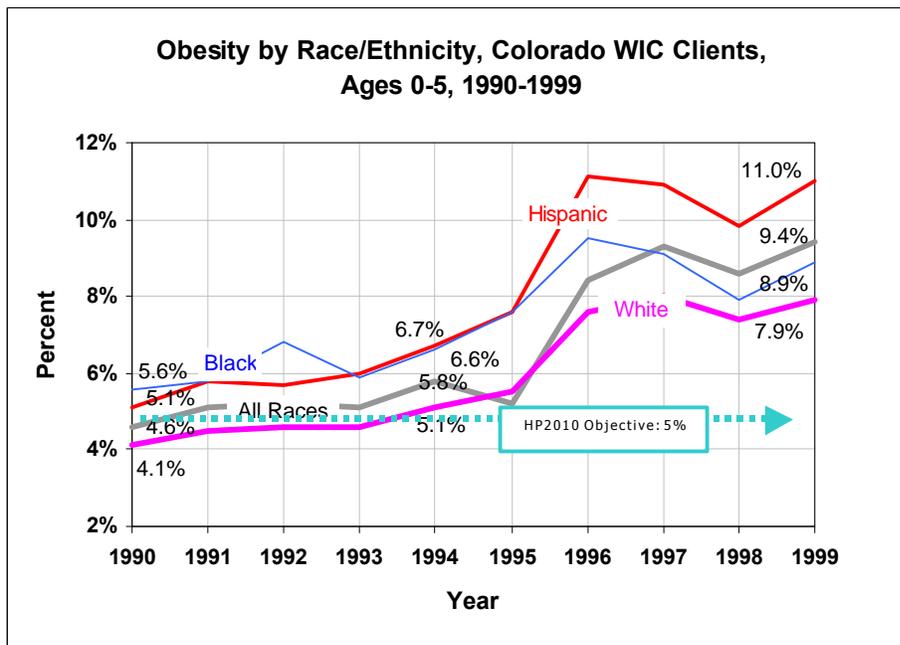
Oral Health

The Oral Health Program is planning an oral health needs assessment among kindergarten through third grade school-age children in the upcoming year. The collected data will not only provide Colorado with valuable oral health status information, but will also feed into the newly established National Oral Health Surveillance System, the dental component of the National Public Health Surveillance System. The lack of dental care among the nation’s poorest children is seen as a critical health problem, and quantifying the problem in Colorado will provide important new data.

Obesity

Figure 11 shows the increase in the proportion of WIC clients age 0 to 5 who are above the 95th percentile in weight for height and are considered to be obese. Racial/ethnic disparities reveal elevated proportions of obesity among black and Hispanic children compared to white non-Hispanic children, and increasing disparities between racial/ethnic groups over time.

Figure 11.



Note: Data system improvements in 1996 may exaggerate the increase mid-decade.

The growing proportion of children who are obese is increasingly identified as an urgent health problem for children, with long-range implications for their health as adults. The Healthy People 2010 objective is 5 percent, a level that is much lower than the proportion found in children today.

Death Rates

The death rates among children ages 1 to 14 show a general downward trend over the decade, with the total rate for 1996-1998 of 22.5 meeting the Healthy People 2000 objective of 28.0. Figure 12 demonstrates that disparities by race/ethnicity have improved, such that the range between groups in 1996-1998 is much smaller than it was in 1990-1992. Hispanic as well as white non-Hispanic children have met the Healthy People 2000 objective, but the death rate for black children, 35.9 in 1996-1998, is still 60 percent higher than the white non-Hispanic rate.

Figure 12.

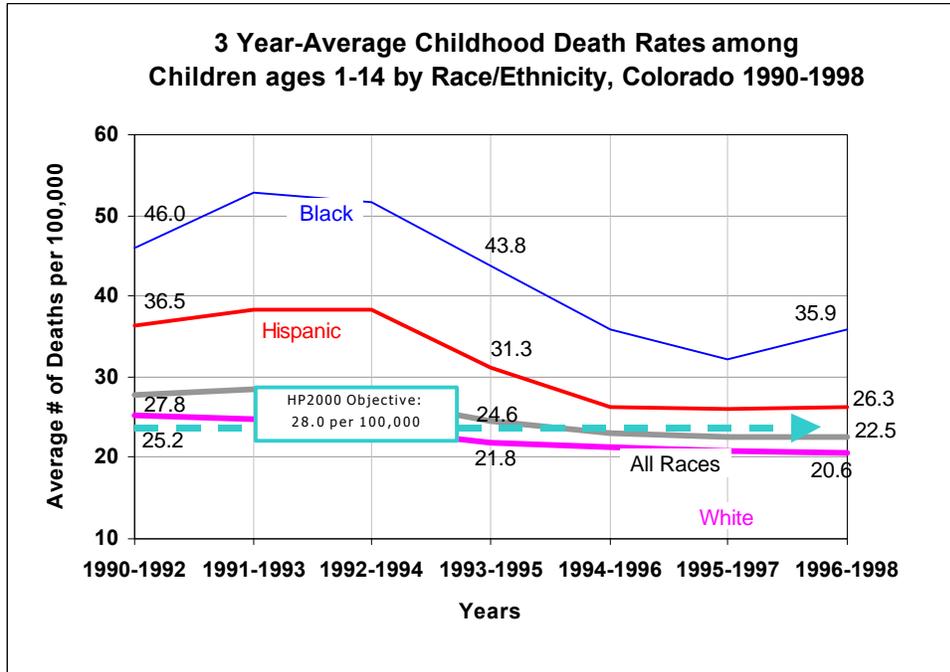
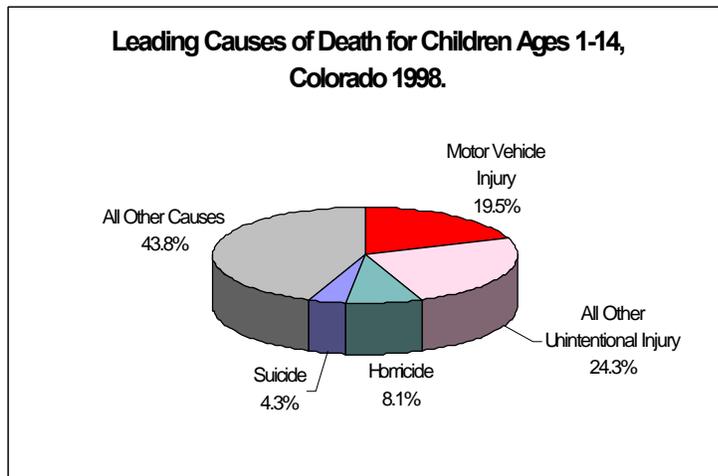


Figure 13.



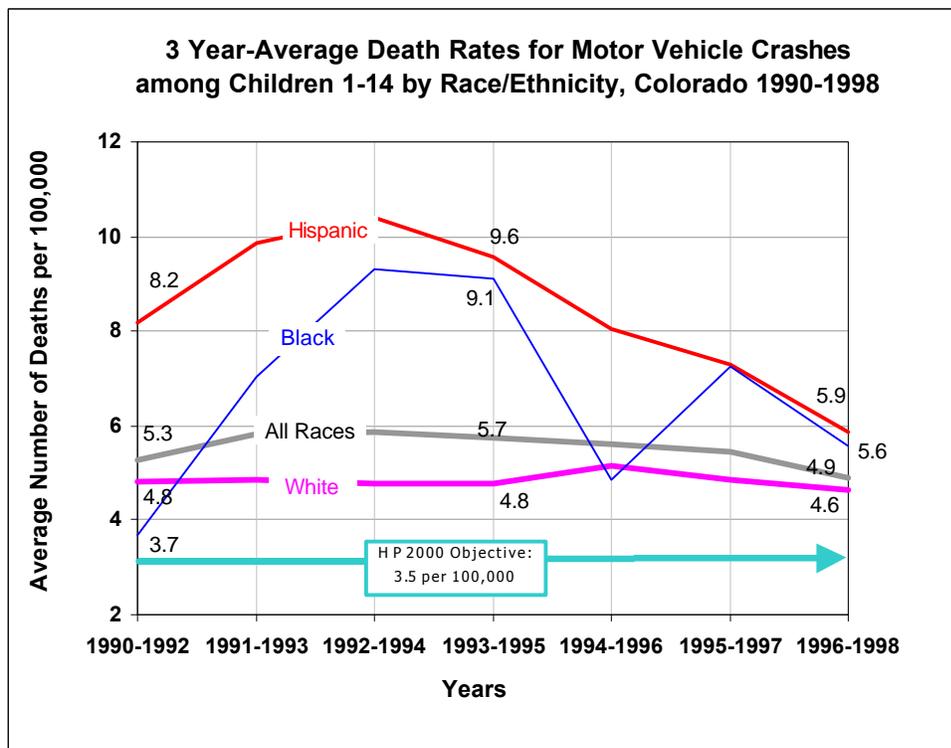
The leading causes of death for children ages 1-14 are injury-related. Figure 13 shows that 19.5 percent of deaths in children are due to motor vehicle injury and another 24.3 percent are due to all other unintentional injuries. A total of 8.1 percent are due to homicide and 4.3 percent to suicide.

Motor vehicle injury is the leading cause of death for children ages 1-14 years. Figure 14 shows three-year average death rates for children ages 1 to 14 over the decade. The overall

trend is downward, toward the Healthy People 2000 target of 3.5 deaths per 100,000 children, but the goal has not yet been met. Wide disparities by race/ethnicity at the beginning of the

decade have narrowed, and the range in 1998 was a low of 4.6 deaths per 100,000 children among white non-Hispanic children, compared to 5.9 among Hispanics and 5.6 among blacks.

Figure 14.



In the last needs assessment completed for the Maternal and Child Health Block Grant in 1995, deaths due to drowning were above the level of 2.3 targeted for Healthy People 2000. Since that time, the overall drowning rate has declined to 2.2 for all races, meeting the goal, and differences for racial/ethnic groups are minimal for 1994-1998. Deaths due to drowning are few in number, averaging a total of six per year in Colorado for this age group for the period 1994-1998. The Child Fatality Review Committee data have shown that drownings in Colorado are more likely to occur in irrigation ditches, lakes, and rivers than in swimming pools.⁷

Though death is obviously the most extreme and tragic result of an injury, non-fatal injuries are also an important and serious issue for children in this country. A recent article in *Pediatrics* has estimated that approximately one in four children in the United States are injured each year, with tremendous corresponding medical costs.⁸ Physician and emergency room visit data are not available for Colorado, but childhood nonfatal injury hospitalization rates are calculated for the period 1995-1997. The rates range from 201 hospitalizations per 100,000 children age 5-9 to 268 per 100,000 children age 1-4, 344 per 100,000 children age 10-14, up to 442 per 100,000 infants.

⁷ A Child Fatality Review Committee brief on drowning was released in June 2000, and can be accessed from the committee website at <http://www.cdphe.state.co.us/pp/cfrc/cfrchom.asp>.

⁸ Evangeline R. Danseco, Ted R. Miller, and Rebecca S. Spicer, "Incidence and Costs of 1987-1994 Childhood Injuries: Demographic Breakdowns," *Pediatrics*, 2000; 105: e27.

The causes of injury hospitalization vary a great deal by the age of the child. The top four causes for infants under one are falls (20 percent), assault (15 percent), suffocation (14 percent), and other unintentional injury (24 percent). Motor vehicle crashes account for only 4 percent. For children age 1 to 4, the leading causes are falls (25 percent), poisoning (14 percent), assault (5 percent), and other unintentional injury (21 percent). The rate of hospitalizations for motor vehicle crashes doubles, increasing to 9 percent.

Among children 5 to 9, the leading causes are falls (32 percent), motor vehicle crashes (23 percent), bicycle accidents (10 percent), and other unintentional injury (13 percent). Among 10 to 14-year olds, the leading causes are falls (19 percent), motor vehicle crashes (18 percent), self-inflicted injury (13 percent), and other unintentional injury (31 percent). The share of hospitalizations due to motor vehicle crashes is highest in the 5-9 age group.

Differences in injury hospitalizations are also apparent across the state, with the highest rates in the rural counties.

Summary for Children

The picture of health among children during the decade of the 1990's is mixed. Immunization coverage is well below nationally desired levels even though improved from the late 1980's, obesity is increasingly considered a critical problem with long-range implications, dental care is lacking for many, and high levels of hospitalizations for injury provide opportunity for reduction among unintentional injuries, especially for motor vehicle crashes. Death rates overall, however, are down significantly over the decade, at levels below the Healthy People 2000 objective, and racial and ethnic death rate disparities have narrowed a great deal.

Adolescents

It is well known that the adolescent years present challenges to maternal and child health. While teenagers are for the most part healthy and active, they may engage in risk-taking behaviors that can result in severe injury and loss of life. The Youth Risk Behavior Survey (YRBS) was developed by the Centers for Disease Control and Prevention to focus on health risk behaviors. After reviewing the leading causes of morbidity and mortality among youths, the Centers for Disease Control and Prevention found that nearly all contributing behaviors could be categorized within a half dozen areas, including behaviors resulting in intentional and unintentional injuries, tobacco use, alcohol and other drug use, sexual behaviors contributing to sexually transmitted diseases (STDs) and unintended pregnancies, dietary behaviors and physical activity.

Colorado has been participating in the YRBS since 1990. The following section includes select results from the Colorado YRBS from 1995, 1997, and 1999. Please note that comparisons across the years are not appropriate because the only data that were weighted come from 1995. The two more recent surveys did not have high enough response rates to be weighted, so the results from these surveys may not be generalized to all public school students in grades 9 through 12 in their respective jurisdictions. Any comparisons of the surveys across time should be made very cautiously.

Tobacco, Alcohol and other Drug Use

Adolescence is a time when teens may experiment with various substances including tobacco, alcohol and other drugs. It is well known that people who initiate smoking during their teen years are more likely to remain smokers as adults (1995 Colorado YRBS). Smoking is the single most important preventable cause of death in Colorado, as well as in the United States. Current estimates show that over 4,600 Coloradans die each year of smoking-related causes, accounting for nearly 20 percent of all deaths. During the 1995 and 1997 Colorado YRBS surveys, approximately 70 percent of surveyed teens had reported having tried smoking at least once in their lives. This proportion was estimated at 78 percent in 1999, and between 34 and 37 percent reported smoking cigarettes during the past 30 days. Results from the 1997 United States YRBS yielded very similar results. Nationally, 70 percent of teens had tried smoking at least one in their lives and approximately 36 percent of students smoked during the past 30 days. Additionally, 25 percent of Colorado males and 4 percent of Colorado females reported using chewing tobacco or snuff, a risk factor for periodontal disease in adolescents. These figures are higher than the 1997 U.S. figures which indicated that 16 percent of male students and less than 2 percent of female students used smokeless tobacco.

Alcohol use is also a major health problem for teens. Unintentional injuries are the leading cause of death for adolescents, with a significant proportion of these deaths related to alcohol use. The 1995 Colorado YRBS found that 83 percent of surveyed teens reported having had at least one drink during their lives; in 1997, 78 percent. Nationwide, 79 percent of students in 1997 reporting having had at least one drink of alcohol during their lives. This proportion was reported as 87 percent in 1999 for Colorado. Between 35 to 38 percent reported having their first drink by age 13. In terms of current drinking habits, 53 percent of students reported drinking alcohol during the past 30 days in 1995; in 1997, 54 percent; and in 1999, this proportion was 59 percent. In 1997, the U.S. YRBS reported that half (51 percent) of students reported drinking alcohol during the past 30 days. Additionally, in Colorado in 1995, 35 percent had reported drinking five or more drinks in a row, within a couple of hours, during the past 30 days; in 1997, 37 percent; and in 1999, 42 percent. Since the 1997 and 1999 data are unweighted, changes between the years may be more apparent than real. Nationally, 33 percent of students reported heavy episodic drinking in 1997.

Use of illegal drugs by adolescents is a risk factor for morbidity, mortality, teen pregnancy, poor school performance, dropping out of high school, and sexually transmitted diseases, including HIV/AIDS (1995 Colorado YRBS). Marijuana is the most widely abused illicit drug among adolescents. The 1995 and 1997 Colorado YRBS found that 46 to 48 percent of the surveyed teens had tried marijuana at least once during their lives. This proportion appeared to be up to 56 percent in 1999. Nationwide, 47 percent of students had reported using marijuana in their lifetime in 1997, similar to results from Colorado during that year. Also, about 30 percent of Colorado students reported using marijuana during the past 30 days and 8 to 12 percent of students had done so on school property. The U.S. YRBS reported that one fourth (26 percent) of students had used marijuana one or more times during the past 30 days in 1997 and 7 percent had done so on school property.

Obesity

The Healthy People 2000 Objective for adolescent obesity is 15 percent among teens ages 12 through 19. The majority of obese adolescents will remain obese in adulthood (1995 Colorado YRBS). Adolescent eating habits are often characterized by snacking, fast foods, and missed meals, frequently contributing to diets higher in calories, saturated fat, cholesterol and salt. An equally disturbing trend is dissatisfaction with body weight, especially among girls. Being obsessed with being thin may contribute to eating disorders such as anorexia and bulimia. The 1995 and 1997 Colorado YRBS surveys found that 34 and 29 percent, respectively, of female students described themselves as “slightly” or “very” overweight; this was up to 42 percent for females in 1999, and for all survey years, approximately sixty percent of all females reported that they were currently trying to lose weight. In 1999, questions were added asking students to report their height and weight so that BMIs (Body Mass Index) could be calculated to obtain a reasonable proxy of determining whether students were overweight or at risk for becoming so. Nearly 16 percent of students were “at risk for becoming overweight” while nearly 7 percent were overweight in 1999.

Physical Activity

Physical activity is beneficial for all age groups, including teens. Studies indicate that adolescence may be the best time to develop positive lifestyle behaviors like good nutrition and exercise. Exercise can reduce the likelihood of obesity and can assist in the prevention of heart disease, hypertension, diabetes, osteoporosis, and mental health problems (1995 Colorado YRBS). During the 1995, 1997, and 1999 YRBS surveys, approximately three-quarters of males reported exercising or participating in sports activities that made them sweat or breathe hard at least three times during the last week. Slightly more than half of the females reported working out to this degree in 1995 and in 1997, 64 percent of females responded positively to this question; in 1999, this percent dropped to 55 percent. Nationally, 64 percent of students reported working out to this degree in 1997; 72 percent of males and 54 percent of females.

In 1995 and 1997, 41 percent of all Colorado students reported attending physical education classes (PE) daily while only 27 percent reported attending daily PE classes in 1999. According to the 1997 national survey results, 27 percent of students were enrolled in a daily PE class. In 1995 and 1997, 37 and 38 percent, respectively, of students in Colorado indicated that they played sports or exercised for more than 20 minutes during an average PE class. The question was asked differently in the 1999 survey and of those who attended PE classes, 82 percent played sports or exercised for more than 20 minutes during an average class. In 1995 and 1997, 50 and 52 percent, respectively, of all students played on one or more sports teams at their school, while 39 and 42 percent reported playing on one or more sports teams sponsored by outside organizations during the past year. Nationwide, in 1997, 38 percent of students had played on sports teams run by organizations unaffiliated with their school during the 12 months preceding the survey while half (50 percent) had played on sports teams run by their school during the previous 12 months. The question was phrased differently in 1999 and 61 percent of students reported playing on one or more teams during the previous year.

Teen Sexual Activity

The Colorado YRBS also includes a number of questions related to sexual activity. Risky sexual behaviors, such as unprotected sexual intercourse, can lead to undesirable outcomes like

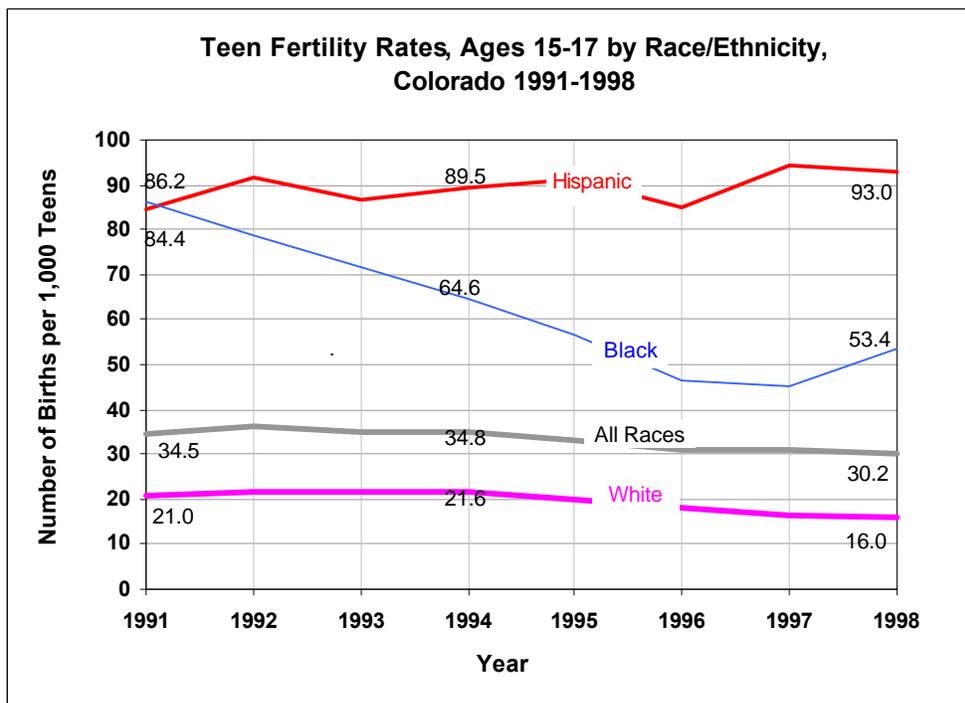
unwanted pregnancies and sexually transmitted diseases. Among surveyed students in 1995, 47 percent reported having had sexual intercourse at least once; in 1997, 41 percent; and in 1999, 51 percent. Nationally, the results were very similar—nearly half (48 percent) of students had had sexual intercourse during their lifetime, when asked in 1997. When current sexual activity was examined, 31 percent of Colorado students had sex during the three months prior to taking the survey in 1995; in 1997, 29 percent; and in 1999, 38 percent. The 1997 U.S. YRBS reported that 35 percent of students had had sexual intercourse during the three months prior to taking the survey. Additionally, between 13 and 16 percent of Colorado students had reported having sex with four or more people during their lives, very similar to the 16 percent reported nationally in 1997. When asked about protecting against STDs and pregnancy, 53 to 59 percent of Colorado students had reported using a condom during their last sexual intercourse. Nationwide, 57 percent had reported using a condom during their last sexual intercourse in 1997.

Teen Fertility

Women under 18 are at increased risk for poor pregnancy outcomes and are more likely than older women to have low birth weight infants. They are unlikely to plan the pregnancy (70 percent admitted in the 1997-1998 PRAMS surveys that their pregnancy was unintended); more than one out of three are smokers; and the majority (55 percent) must have their prenatal care covered by Medicaid because they lack adequate financial and insurance resources.

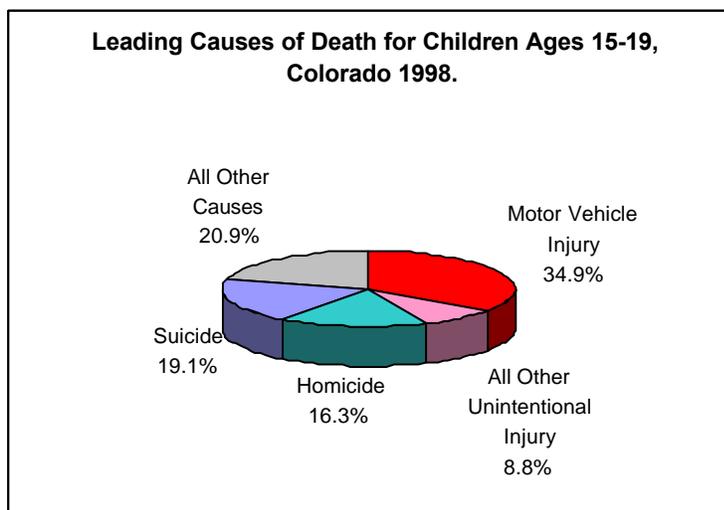
Figure 15 shows the fertility experience of this young group of women since 1991. Overall, the age-specific fertility rate fell from a high of 36.3 births per 1,000 young women in 1992 to a low of 30.2 births in 1997 and 1998, a 17 percent decline.

Figure 15.



15.3 births per 1,000 teens. These counties are found in all parts of the state, although none (except Douglas) is in a metropolitan area.

Figure 16.



Unintentional injuries and motor vehicle crashes

Paramount among the risks for teens are those associated with motor vehicles. When the leading causes of death are examined for adolescents, as shown in Figure 16, a different picture emerges from that which is encountered for earlier childhood. Motor vehicle injury is the leading cause of death for 15 to 19 year olds at approximately 35 percent while all other unintentional injuries comprise 8.8 percent. Suicides and homicides become the second and third leading

causes of death for 15-19 year olds with 19.1 percent of the deaths attributed to suicide and 16.3 percent to homicide.

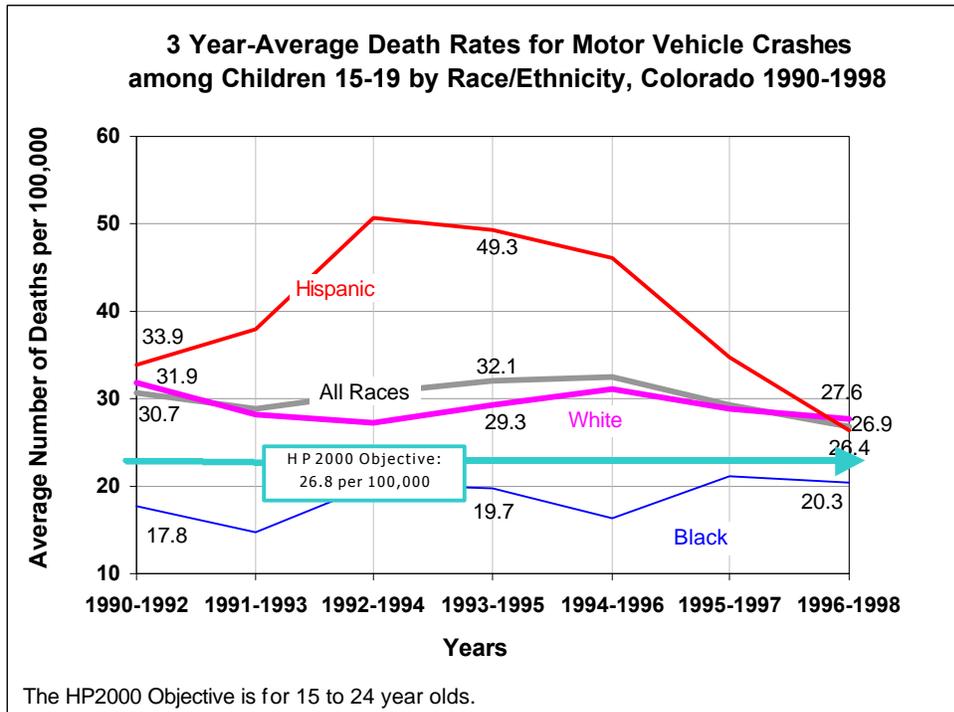
Many motor vehicle deaths are alcohol-related. The Colorado YRBS surveys reveal that approximately 40 percent of students reported riding in a vehicle driven by someone who had been drinking alcohol during the past 30 days. In 1995 and 1997, between 16 and 17 percent of students reported having driven a car after drinking alcohol at least once during the past 30 days. This percentage appeared to be up to 20 percent in 1999.

Seat belt usage is also measured by the YRBS. More Americans are wearing their seat belts now than ever before, and this trend is also seen with teen drivers. In 1995 and 1997, 22 and 21 percent, respectively, of Colorado students reported that they “never” or “rarely” wore a seat belt when riding in a car. This proportion was improved to 15 percent among respondents in 1999, suggesting that seat belt usage had increased to 85 percent.

Child Fatality Review Committee data reveal that seatbelts were used in only 13 percent of those fatalities in which at least one driver was under 21 years of age.

Figure 17 demonstrates a decreasing trend in three-year average death rates for motor vehicle accidents among adolescents ages 15 to 19 since the middle of the decade. The racial disparities observed earlier in the decade have narrowed so that the Hispanic and white non-Hispanic rates for 1996-1998 are not statistically different at 26.4 and 27.6 deaths per 100,000, respectively. For this three-year time period, both Hispanic rates and black rates are below the Healthy People 2000 objective of 26.8 per 100,000 (although the objective applies to 15 to 24 year olds), while the overall rate, at 26.9, is nearly as low, but does not meet the objective. The geographic pattern of motor vehicle death rates is difficult to map because many small counties have few deaths.

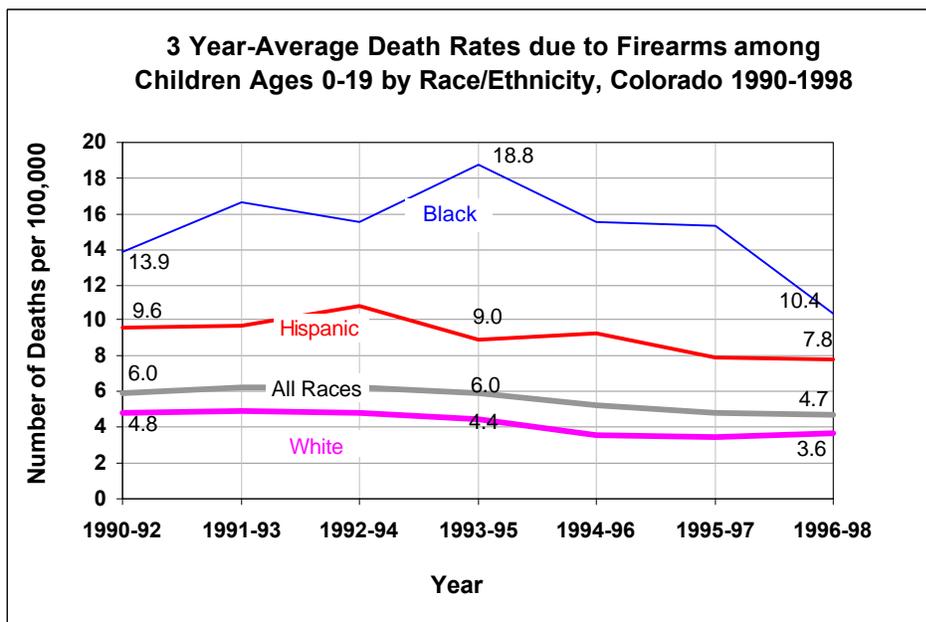
Figure 17.



Firearms, Homicide and Suicide

As shown in Figure 18, the three-year average death rates due to firearms among children of all races, ages 0 to 19, slowly decreased after the mid-1990's. The death rate for black children peaked in 1993-1995 at the high rate of 18.8 firearm-related deaths per 100,000 and has since declined to 10.4. From 1993-1995 to 1996-1998, there was nearly a 50 percent decline in the firearm death rate among blacks. There also were decreases over the entire decade among Hispanics and white non-Hispanics (19 percent and 25 percent, respectively). However,

Figure 18.



significant disparities still exist among the racial and ethnic groups. The death rate due to firearms among Hispanic children is twice that observed for white non-Hispanic children while the death rate for black children is almost three times higher than for white non-Hispanic children.

Further information on firearms deaths is available in a Child Fatality Review Committee Brief released in May 2000. The complete text is available in Section 5.3, Other Supporting Documents. In the five-year period studied, 1993 through 1997, there were a total of 193 firearms deaths among children under the age of 18 in Colorado.

Youth Risk Behavior Survey data reveal that approximately 20 percent of students surveyed reported carrying a weapon (gun, knife, or club) during the past 30 days in each of the three survey years. Six percent of teens had carried a gun during the past 30 days, and between 10 to 12 percent of students had carried weapons onto school property. Another indicator of teen violence is the proportion of students who report being in physical fights. In Colorado, more than one-third of students had reported being involved in a physical fight during the past 12 months; 15 to 16 percent reported having a physical fight occur on school property.

Figure 19 shows three-year average rates of death due to homicide per 100,000 15 to 19 year olds. The overall 1996-1998 rate for all races was 8.8 per 100,000, which is higher than the Healthy People 2000 objective of 7.2. Rates for the decade increased greatly for minority groups in the first five years and then fell in the second period, ending in 1998 with levels comparable to those at the beginning of the decade. Rates from 1990-1992 to 1996-1998 decreased for white non-Hispanic teens by 25 percent while remaining the same for Hispanic teens and increasing by 5 percent for black teens. The black rate peaked at 67.7 in 1993-1995 but has declined considerably since then. The disparities among racial and ethnic groups have not significantly changed from 1990. During 1996-1998, homicide deaths among white non-Hispanic teens were much lower at 3.9 per 100,000 than for blacks (40.7) and Hispanics (24.9).

Figure 19.

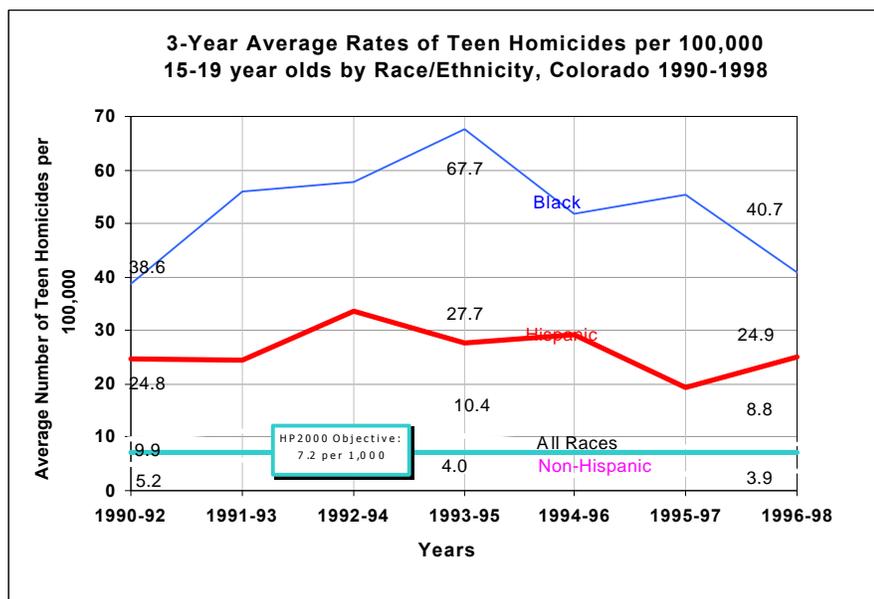
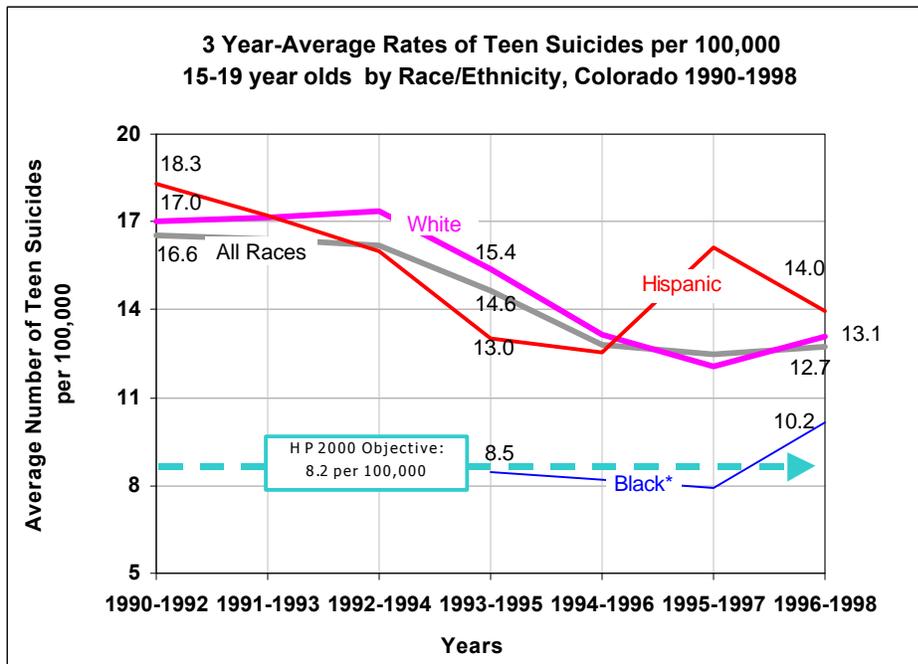


Figure 20 displays three-year average rates of teen suicide per 100,000 persons ages 15 to 19. Since 1990-1992 there has been a 24 percent decrease in all teen suicides, from 16.6 per 100,000 teens to 12.7. Among racial and ethnic groups, this downward trend may be observed for Hispanic and white non-Hispanic teens, but the suicide rate among black teens actually increased about 15 percent during this same time span. Still, the 1996-1998 rate of Black teen suicide is lower at 10.2 per 100,000 than for white non-Hispanic teens (13.1) and Hispanic teens (14.0). Colorado's suicide rate of 12.7 is still over 50 percent higher than the Healthy People objective of 8.2 per 100,000.

Figure 20.



Note: Values prior to 1992-94 for blacks can not be shown due to small numbers.

Summary for Adolescents

Teenagers in Colorado continue to take unwarranted risks with tobacco, alcohol, and sex, and physical inactivity and apparently increasing obesity threaten their future lives as adults. At the same time, the most severe consequences of these negative behaviors have been reduced over the decade. Teen fertility (except among Hispanics) is substantially reduced from levels early in the 1990's, motor vehicle deaths have fallen, and racial and ethnic disparities in death rates have fallen as well. The firearm death rate has declined, and the suicide rate has also declined, but the homicide death rate and the suicide death rate especially remain above Healthy People 2000 goals.

Summary of Health Status for the Maternal and Child Health Population

Many maternal and child health issues have been discussed briefly in this section. On the whole, a more thorough presentation of the state of health of Colorado's mothers and children has been possible than in the previous 5-year Needs Assessment in 1995. This is due to improvements in data availability, through surveys like the Pregnancy Risk Assessment Monitoring System and the Youth Risk Behavior Survey, by access to vital statistics databases through query systems, and through the work of the Maternal and Child Fatality Review Committees. Improvements in

computer presentation, especially the use of graphs and maps, contribute to our understanding of the issues.

A total of some twenty maternal and child health issues have been presented. Among the dozen or so for which data were available for 1990, virtually all show improvement at the end of the decade (1998), including reductions in racial and ethnic disparities, and only two measures, the low birth weight rate and obesity among children, have worsened. Among the eleven that can be compared to the Healthy People 2000 goals, four (infant mortality, breastfeeding, child deaths, and child drowning rates) have met the goals, three (trimester prenatal care began, motor vehicle deaths, and homicide) are very near the goals, and four (low birth weight, immunization, obesity, and suicide) fall substantially short of the goals. Other measures, such as teen fertility and unintended pregnancy in all age groups, do not have corresponding Healthy People 2000 goals, but levels are relatively high compared to other states.

The gains made during the past decade are exciting evidence of a general overall improvement in health and safety for Colorado children, but the areas where Colorado falls far short of the goals remain as major challenges. Addressing the issues of unintended pregnancy, the high level of fertility among Hispanic teens, low birth weight, immunizations, obesity, and suicide among adolescents may require additional resources, attention, and commitment in the next five years, greater than those already available, if Colorado is to continue to improve the health of its youngest residents.

3.1.2.2 Direct Health Care

Direct health care services are defined as basic health services. Such services are generally delivered “one on one” between a health professional and a patient in an office, clinic, or emergency room. Basic services include what most consider to be ordinary medical care, inpatient and outpatient medical services, allied health services, drugs, laboratory testing, x-ray services, dental care, and pharmaceutical products and services. State Title V programs support services such as prenatal care, child health, school health and family planning by directly operating programs or by funding local providers. Direct health care services also include health care services for children with special health care needs.

Direct Care Service Priority Needs

Access to direct health care services continues to be an issue in many rural and urban communities throughout Colorado due to financial barriers and limited provider availability.

Priority concerns for maternal and child populations include:

- limited access to prenatal care for low-income undocumented women;
- limited access to primary health care services for children who are low-income, particularly those who are undocumented and therefore not eligible for Medicaid or the Colorado Child Health Plan Plus (CCHP+), Colorado’s child health insurance program, or the state’s indigent care program;
- limited access to oral health care for low-income children;
- limited access to mental health services for children; and
- limited access to some pediatric specialty care services due to lack of providers in the community or to lack of coverage for specialty services as benefits of insurance coverage.

Direct Care Services for Perinatal Populations

Colorado, like many states, saw dramatic improvement in access to prenatal care for low-income women as a result of the expansion of Medicaid in 1989 to cover pregnant women below 133 percent of poverty. The increased use of managed care plans to serve Medicaid recipients, which began in 1995, has also improved access to prenatal care for women who are Medicaid-eligible in some areas of the state. However, there continues to be a need for maternal and child health funding to serve as a “gap-filler” for uninsured women above 133 percent of poverty and for undocumented, uninsured women who are eligible only for emergency Medicaid benefits.

Maternal and child health funds are used to support prenatal services through local public health departments or county nursing services. The local agencies may provide services themselves or may provide funding to community health centers, private providers or to family medicine residency programs in their communities. The amount of funding provided is only partial reimbursement for the cost of care. A number of county or district public health departments have discontinued their prenatal care clinics in the past several years. Others are planning to transition their prenatal care services to private providers now accepting Medicaid patients, and to community health centers which will serve both Medicaid patients and uninsured pregnant women. MCH funding is needed, however, in communities that do not have a community health center or when the community health center does not have sufficient capacity to meet the needs.

State legislation passed in 2000 will improve the availability of prenatal care for undocumented women, using a managed care plan to provide the additional prenatal care services for the same amount of funding as Medicaid provides for the hospital delivery services. It is anticipated that we will be able to transition out of using Title V funds for prenatal care for this vulnerable population in the future. It will take some time for the plan to develop a network to serve this population that is statewide.

Direct Care Services for Child and Adolescent Populations

Access to primary and preventive care services for children and adolescents is also limited in many areas of Colorado. As with low-income women, the expansion of Medicaid to more low-income children and the use of managed care plans to serve Medicaid populations has increased access to care. However, the assets test, which still applies to children applying for Medicaid, prevents many children in families with very modest incomes and assets from being eligible for Medicaid. A family car with a value over \$1,500 means that the children in that family who are over one year of age do not qualify for Medicaid benefits. This assets restriction greatly limits the number of children who qualify.

As other states have experienced, the delinking of Medicaid eligibility from welfare benefits has had the unintended effect of discontinuing Medicaid benefits for many children who should have remained eligible. Another barrier to care resulting from welfare reform is fear on the part of immigrant families with some members who are undocumented that they will be deported if they attempt to use Medicaid services, even for their American-born children who are citizens and potentially eligible for Medicaid. Another very real barrier to care is a widespread societal value that Medicaid is a form of public assistance that many working families are too proud to use. Still another barrier to care is the lack of providers willing to serve Medicaid populations in some communities, particularly dentists.

The creation of the Colorado Child Health Plan Plus (CHP+), Colorado's "stand-alone" child health insurance program, has increased access to care for uninsured children in many communities. As of May 2000, there were 24,148 children enrolled. With the number of potentially eligible children estimated at 69,157, this level of enrollment is somewhat disheartening, particularly for the local public health agencies, community health centers and other advocates working at the community level to promote enrollment. Factors serving as barriers to care are a relatively high monthly premium rate, as well as a lengthy application process. A lack of providers willing to serve children under the Child Health Plan Plus, which uses the same managed care plans as those contracting to serve Medicaid, is a problem in some communities also.

As with prenatal care, many local public health agencies have discontinued the child health care services they previously offered as the number of children who could be served by Medicaid or Child Health Plan Plus providers has increased because of expanded eligibility programs and managed care presence. However, before public health agencies discontinue child health direct care services, it is important that collaborative planning with community agencies be undertaken to assure both the intention and the capacity of other providers in the community to serve

Medicaid, Child Health Plan Plus, and uninsured children.

Oral Health

The Oral Health Program partners with Kids In Need of Dentistry (KIND) and Health SET, two private non-profits, to provide sealants to low-income second grade children in Metro Denver. The Chopper Topper Sealant Program is currently operating at maximum capability (staffing and equipment), so eligible schools (75 percent of students receiving free and reduced price school lunch) enter a lottery at the beginning of the school year to participate, which leaves many children without this preventive service. Nearly a quarter of the children screened for sealants require emergency care for rampant decay and abscessed teeth. Finding resources to provide the needed care continues to be problematic, especially for those children who are eligible for Medicaid. Fifty percent of the low-income children served by this program do not have Medicaid or other form of dental insurance.

School Based Health Care Services Needs

School-based health care is another direct care service essential community provider in Colorado, presently serving one out of every eighteen public school children (5.7 percent). The availability of medical care provided where children spend much of their time, in school, has proven to be a very successful model in many communities in Colorado. Continued growth in school-based programs is not assured, however, and this type of service is not available in most areas.

Direct Care Services for Children with Special Health Care Needs

Colorado's Health Care Program for Children with Special Needs (HCP) is working diligently with several of the managed care plans that are contracted to serve Medicaid recipients and with the Child Health Plan Plus providers to provide "seamless" systems of care that guarantee access to specialty care throughout the state. As increasing numbers of children are enrolled in either Medicaid managed care or the Child Health Plan Plus systems, it is anticipated that more of the need for both primary care and specialty care will be borne by those programs, decreasing the reliance on HCP to use resources to pay for direct care services. This vision is not being realized as quickly as anticipated, due to the slower rate of enrollment of children in the Child Health Plan Plus and the loss of Medicaid eligibility by children because of the delinking of Medicaid from the welfare system.

For children who are enrolled in CHP+, HCP provides specialty care that is needed as a "wrap-around" to the benefits provided by the Child Health Plan Plus system. These services include hearing aids, expendable and durable medical equipment, nutrition counseling by Registered Dietitians and counseling by Social Workers, glasses and therapies--all services which have maximum benefit limits or are not included at all in the Child Health Plan Plus. To assure the statewide availability of needed specialty services, HCP organizes over 340 specialty clinics in thirty-two communities around the state providing pediatric neurology, cardiology, otology, orthopedic, developmental evaluation, and ADD/ADHD service. Such clinics are offered in rural areas to all children with special needs including those with Medicaid, Child Health Plan Plus, private insurance, and no insurance. Due to the limited number of pediatric providers (and in some cases such as in neurology--the decreasing number of providers) and the increasing number of children requiring specialty services, the possibility of employing tele-medicine for the delivery

of pediatric specialty care is a future joint venture between HCP, local hospitals and some of the managed care plans.

3.1.2.3 Enabling Services

Enabling services are defined as services that allow or provide for access to and the derivation of benefits from the array of basic health care services. Enabling services include transportation, translation, outreach, respite care, health education, family support services, purchase of health insurance, case management, and coordination of care. These kind of services are especially necessary for the low-income population which is disadvantaged, geographically or culturally isolated, and for those with special or complicated health needs.

Enabling Services for Perinatal Populations

The Women's Health Section, under contract with the state's Medicaid agency, provides enabling services under the Prenatal Plus program for women whose pregnancies are high-risk. The package of enhanced services, which augment the prenatal clinical services provided by Medicaid providers, include counseling by Registered Dietitians and mental health professionals, health education, and case management services provided by public health nurses and paraprofessional community health workers. The Prenatal Plus program services are provided with Medicaid funding through a contract with the Department of Health Care Policy and Financing. Maternal and child health funds are used by a number of local public health agencies to help support the program because the amount of Medicaid funding only covers a portion of the costs. MCH funds are also used to provide the same services for a limited number of women who are not eligible for Medicaid. Now in its fourth year of implementation, the Prenatal Plus program continues to prove the cost-effectiveness of this method of intervention, which is discussed further in the infrastructure-building section.

Local public health agencies are often presumptive eligibility sites for Medicaid. These services are coordinated with those of the Medicaid-funded Early and Periodic Screening, Diagnosis and Treatment (EPSDT) Outreach and Case Management staff. These staff are employed by county public health departments and county nursing services throughout the state, and actively assist women in establishing eligibility for Medicaid or finding alternative sources of care and related services. The staff of the state's Family Healthline, accessible by a 1-800 number for areas outside the Denver calling area, are experts in directing women to sources of care and services throughout the state. The Healthline staff are bilingual in Spanish and English.

Local public health agencies are increasingly employing bilingual/bicultural community health workers to promote early and appropriate use of prenatal care. These workers also assist women to establish eligibility for Medicaid, and to provide education about how to obtain care and related services, including how to access care under the Medicaid managed care systems. The majority of such staff members are Spanish-speaking but a few local health departments employ staff who are Vietnamese, Chinese, and Khmer (Cambodian) speaking. Alternatively, local public health agencies also provide interpretation services through contracting with individuals from the community on an as-needed basis and through using the AT&T Language Line. Translation of written materials is also contracted for by the local agencies and at the state level for those

materials supplied by the state. A resource manual on recommended processes to provide interpretation and translation services was completed by a cross-program committee for the Family and Community Health Services Division. Distributed in August 1999, it has been used by local agencies to build their systems to assure good communication with clients served by their agencies.

Enabling Services for Child and Adolescent Populations

The need for outreach and information and case management or service coordination services to assist low-income families to access health care and related services has increased. The systems have become more complex to negotiate, both for applicants and recipients, even as services have become more available through Medicaid managed care expansion and through the Child Health Plan Plus. Colorado has been fortunate in that there has been a partnership between public health/Title V and the state Medicaid program to promote the effective use of the Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) program by families with Medicaid-eligible children. As mentioned above, the EPSDT Outreach and Case Management staff are present in every county throughout the state, even if only part-time, to promote the use of EPSDT services. These Medicaid-funded EPSDT Case Managers have helped the local agencies develop real expertise in helping families establish eligibility, not only for Medicaid benefits but for the many other programs and services which might improve a woman's, child's or family's well-being. Local public health agency staff are well-positioned to provide information and assistance to families, promoting their use of either Medicaid or the CHP. The extensive efforts that are being carried out by state and local public health agents through the RWJ-funded Covering Kids grant is discussed under infrastructure-building services.

Enabling Services for Children with Special Health Care Needs

As mentioned under direct care services, the Health Care Program for Children with Special Needs is seeking to build a seamless system of care and services for children, using Medicaid and CHP+ to provide preventive, primary and many specialty care services, and HCP to provide additional specialty care and habilitative or rehabilitative services. HCP, therefore, also is actively involved in helping families establish eligibility for Medicaid or CHP+, including assisting families with the Supplemental Security Income (SSI) eligibility process, and working closely with the EPSDT Case Management staff and public health nurses in this effort.

Care coordination services have become increasingly important in assuring that children are able to obtain the care and services they need, especially children with chronic health problems or special health care needs. This is sometimes due to the increasing complexity of the health and service needs of children in communities. It is also due to the increasing complexity of the health care systems that families must negotiate. This is true of the Medicaid managed care system and the Child Health Plan Plus as well as privately financed insurance and managed care plans. HCP staff coordinate with the EPSDT Case Management program staff to optimize the use of their assistance to families. The EPSDT case managers provide such administrative case management services as assistance in making appointments or arranging transportation. The HCP nurses or social workers work with the family to develop plans that assure that children with complex health care or psycho-social service needs are able to obtain all appropriate and needed services to benefit to the greatest extent possible in terms of health and well-being.

The managed care organizations serving Medicaid and Child Health Plan Plus enrollees have begun to recognize the importance of care coordination services for children with special needs. Managed care plans are entering into agreements to coordinate the case management services provided by EPSDT Case Managers, the care coordination services provided by HCP staff, and the services provided by the managed care plans' own case management or service coordination staff. Several managed care organizations have contracted with HCP for expert care coordination services for their enrolled children who have special health care needs.

3.1.2.4 Population-Based Services

Population-based services are defined as services that are intended for and available to the entire population, rather than for a select group of individuals. Disease prevention, health promotion and statewide outreach come under this heading. Oral health, injury prevention, the "School and Community Partnerships for Adolescent Health Promotion," nutrition, outreach, and public education are topics which also belong in this category. Population-based services are generally available for women and children regardless of whether they receive care in the public or private sector or whether or not they have health insurance.

Population-based Services for Perinatal Populations

Colorado has one of the highest low birth weight rates in the nation. Reasons for the problem and possible solutions are presented in *Tipping the Scales: Weighing in on Solutions to the Low Birth Weight Problem in Colorado*, released in June 2000. Four factors were found to have high population attributable risks: multiple births, inadequate maternal weight gain during pregnancy, smoking during pregnancy and premature rupture of membranes. The document, a joint project between the Family and Community Health Services Division and the Health Statistics Section, will be used to develop targeted activities to reduce low birth weight. The document is available on the Internet and is being provided to health care providers, policymakers, payors, and the public in a large educational effort.

The Newborn Screening Program is a population-based program which is highly effective in finding about fifty children each year who screen positive for a variety of newborn genetic and metabolic diseases. This program ensures that all children born in Colorado are tested for these diseases, that those tested positive are confirmed with the disease, and that those needing treatment receive appropriate treatment.

The Newborn Hearing Screening Program is another population-based program which tests the hearing of all newborns shortly after birth. This program ensures that children found with hearing deficits are immediately identified so that they can begin receiving intervention in the first months of life. Colorado has been a national leader in the development of this program in the last few years, and is expecting to identify 120 babies each year who will benefit from the early intervention.

Another population-based service provided statewide is the Sudden Infant Death Syndrome

(SIDS) Program that provides counseling to families who have experienced a SIDS death. The program also provides education to care providers, emergency care providers, and police departments to better enable them to serve families with a SIDS death appropriately.

A relatively new Folic Acid Taskforce, convened by the Women's Health Nutrition Consultant and the Director of the Registry for Children with Special Needs, has implemented an educational effort directed toward obstetrical care providers. Future efforts to develop an educational campaign to reach women and families before they become pregnant are planned.

Population-based Services for Child and Adolescent Populations.

Population-based approaches continue to be needed as preventable injuries are the leading cause of death for children and adolescents. Recognizing the importance of injury prevention, the Maternal and Child Health program has provided modest funding to the Department's Prevention Division to promote development of community-based injury prevention programs. This funding helped to support the production and distribution of two Child Fatality Briefs, with emphasis on prevention—one on firearms fatalities and another on drowning. A regional analysis of child and adolescent hospitalized injuries was also completed. This report is being used to assist local agencies in the development of targeted injury prevention programs, such as a bicycle helmet use project in the San Luis Valley.

The Oral Health Program has been involved in the Injury Prevention Program to develop a pilot bicycle helmet promotion program in pediatric and orthodontist offices. The pilot was launched in April, providing dental offices with educational information to give to patients on bicycle safety and the benefits of helmets, and materials for raffling off donated helmets. While it is still too early to assess program effectiveness, participating dentists are enthusiastic.

Local public health agencies have been utilizing the local print and broadcast media to provide a variety of health education messages to their communities, including promoting enrollment in the Child Health Plan Plus. A statewide television spot to promote the Child Health Plan Plus to eligible families is in development by the Department of Health Care Policy and Financing, with the involvement of public health in the planning

Because the majority of adolescent morbidity and mortality results from preventable behavioral choices, there is a great need to provide population-based services that emphasize both building protective factors, resiliency and "developmental assets," as well as reducing high-risk behaviors. There remains a need for partnerships between public health, schools, youth-serving agencies and others to design and implement these programs and these approaches which focus on building strengths in our youth. At the same time, these programs and approaches can target reduction of both the behaviors and the environments that contribute to the leading causes of death for Colorado teens—unintentional injuries, suicide, and homicide.

Suicide Prevention

Suicide prevention is a specific area where population-based activities are proposed. The 2000 Colorado Legislature passed a bill that creates a suicide prevention program in the Colorado Department of Public Health & Environment. The program will focus on building local capacity to be more effective in suicide prevention. The structure and activities of the program will be

defined during FY 01, and the program is anticipated to have a positive impact on suicide prevention in the future.

Child Care

Health and safety in child care is a critical population-based project that the Family and Community Health Services Division is involved in. Information about this effort is contained on page 14 and 130-131, both in the Annual Report of Performance Measures in FY 99 and in the Annual Plan for FY 01. Results of a needs assessment survey carried out in FY 99 are presented in Section 5.3, Other Supporting Documents, detailing the present level of cooperation and coordination between local nursing services, organized health departments and child care providers. The survey found that about half of all providers utilize health and safety consultation on a regular basis, and that there is a good deal of room for improvement in access to child care nursing consultation.

Lead Screening

Responsibility for lead screening efforts rests in the Lead Poisoning Prevention Program in the Disease Control and Environmental Epidemiology Division. The Program collects, analyzes, and interprets data for children with elevated blood lead levels throughout the state. The Program ensures proper treatment and environmental follow-up for lead poisoned children. Other services the program provides include education to parents and the general public, consultation services to health care providers treating children with lead poisoning, and training and/or assistance with home investigations.

Population-based Services for Children with Special Health Care Needs.

The Newborn Hearing Screening continues to be an important population-based service which benefits children whose hearing losses might otherwise not be detected until the child was age two or three. The Health Care Program for Children with Special Needs continues to administer this program and is particularly involved with the followup of children identified to need hearing intervention. In addition to hearing screening, a Vision Screening Project for young children six months to five years of age is being piloted in five rural and urban sites in Colorado. Based on a needs assessment done in 1998 that confirmed a lack of vision screening for young children, some equipment has been purchased, screening guidelines have been written and five pilot sites identified. The Colorado Lions Club, the Colorado Department of Education, local school districts and public health agencies are involved in working together to develop a community system of screening and followup for identified children.

3.1.2.5 Infrastructure Building Services

Infrastructure building services are defined as those services that are directed at improving and maintaining the health status of a population. Included among those services are development and maintenance of health systems, standards and guidelines, training, data, and planning. Needs assessment, evaluation, policy development, quality assurance information systems, and applied research are all contained within the infrastructure umbrella.

Many of the infrastructure building services or activities, such as the development of the MCH assessment and planning process and the development of the Colorado Health Information Data

(COHID) data system, serve to benefit all three of the MCH populations. The infrastructure building activities that benefit all of the maternal child populations are discussed first, followed by descriptions of those activities particular to each of the three population groups.

Infrastructure building services that benefit all Maternal and Child Health populations

Coordination with Medicaid and the Child Health Plan Plus

The Department of Health Care Policy and Financing is the state agency which administers the state's Medicaid program and Child Health Insurance Program. A cooperative agreement between our agencies describes the many cooperative and collaborative working relationships, including the Title V and Medicaid Agreement. Staff from the Family and Community Health Services Division serve on numerous advisory boards and task forces, bringing to them their expertise on health care needs, access to care issues and quality assurance.

Our long-standing cooperative and collaborative work continues through such efforts as the cooperative agreement that provides Medicaid funding for the EPSDT Outreach and Case Management Program. This program has, for over twenty-two years, employed paraprofessional case managers in the local public health agencies throughout the state to provide information and assistance to assure that families obtain the preventive health care services promised by the EPSDT program. Under a "Strengthening the Safety Net" grant from the Robert Wood Johnson Foundation to the Department for Health Care Policy and Financing, HCP, Child Health and State Systems Development Initiative programs have worked together extensively. The work has included coordination with the Medicaid agency, with the Medicaid managed care plans, and with families to coordinate and improve services for children with special needs.

During 1999, Medicaid enabled electronic access to its STARS system by the Family and Community Health Services Division. STARS (Service Tracking, Analysis and Reporting System) contains a wealth of claims data on all Medicaid patients. Several people in the Division have been trained to use the queryable system, which allows unique queries to be made as well as produces standard reports. The STARS system has already proven very useful to Division staff in analyzing Medicaid patients and programs. The complexity of the system permits precise questions to be answered precisely, but this virtue is also a drawback—defining queries exactly requires extensive knowledge of the Medicaid program and how it works.

MCH Assessment and Plan Development system

The major focus for infrastructure building activities which serves all three populations is the implementation of the new MCH funding methodology and planning process for the state and local public health agencies, as discussed in the Needs Assessment process description in Section 3.1.1 on page 52.

To assist the local agencies in their use of data in the assessment and planning processes, county MCH Data Sets were developed by the state. Technical assistance on the use of the county MCH Data Sets in the development of the County MCH Plans was provided at the regional MCH planning meetings held throughout the state in February 2000. Ongoing technical assistance on data interpretation through the MCH Data Information Specialist and on community-based needs

assessment through a contract with the University of Colorado at Denver provided additional support and capacity development for the local agencies.

The Health Care Program for Children with Special Needs (HCP) developed a funding formula separately, since the program employs a regionalized administrative system, making its funding distribution process different than that of the other MCH funds. However, integration of the planning for services to children with special health care needs with the planning for other children and adolescents and for women is being encouraged. Several county public health departments served as pilots by including the children with special health care needs population in the MCH plan they developed this year and all agencies will integrate all three populations in the plans they develop for future years.

Public Health Workforce Development

Both state and local agency staff need to develop improved skills in data utilization, planning and evaluation. A plan for public health skill development for both local and state agency personnel was developed this year, through the work of Family and Community Health Services Division staff and a public health nurse consultant in the new Colorado Department of Public Health & Environment Office of Local Liaison. This plan utilizes distance learning opportunities in collaboration with the AHECs (Area Health Education Centers) and the University of Colorado Health Sciences Center School of Nursing. It recommends a range of educational methods to meet the needs of state and local staff to build competencies in carrying out the core public health functions.

Data Availability for Local and State Needs Assessment

The Colorado Health Information Dataset Project, known as CoHID, is a combined local and state effort that provides a variety of data to public health professionals in local jurisdictions, as well as to the public. This project evolved from its beginning in 1995 when staff from local health departments and nursing services began working with the state health department to develop a system that could provide answers to data queries easily and rapidly. Prevention block monies were used by Weld County to construct a database that became available on a CD Rom in 1998. Local public health staff were trained in its use, which included querying birth, death, population, and other data at the county, zip code, and tract levels (where available). In 1999, the project shifted to a website and extensive testing took place.¹ Also in 1999 the location of the project moved from Weld County auspices to the Center for Health and Environmental Information Statistics at the state health department. The direction of CoHID is under the Colorado Health Data Advisory Committee, a statewide group of public health data analysts, epidemiologists, and planners.

The CoHID project has been successful in allowing local health officials to use its website to find the latest population, birth, and death information. The data adds a great deal to what is available on the state health department's website that contains much of the state's annual Vital Statistics report. The CoHID site includes data for each year 1990 through 1998, and the ability to ask for

¹ The Web address is "<http://cohid.gen.co.us>".

specific county information that is not available in the report. In addition, many data inquiries to the Family and Community Health Services Division from the general public, other state agencies, private nonprofit organizations, and elsewhere can be directed immediately to the CoHID website, making the information instantly available to those who call. Confidentiality is protected by password security on the site for vital statistics data when the number is less than 3, in keeping with Health Statistics and the National Center for Health Statistics policies.

In the spring of 2000 the project turned to SAS, the statistical software company, for assistance with the technical changes involved in moving the project to the state health department. SAS Internet developed a demonstration of the CoHID dataset that allows for rate calculation in addition to provision of raw numbers. SAS offers a number of enhancements to the CoHID product, including the potential for users to do mapping. The state health department plans to convert the CoHID website to a SAS-based product during 2000. These changes will make queries by users more efficient and useful. The project will also provide Behavioral Risk Factor Surveillance System data and cancer registry data in due course.

Local users continue to learn how to use the CoHID website for their local data needs. Family and Community Health Services Division staff also use the site regularly, and much of the analysis of the health status of the maternal and child health population was accomplished using this system.

Health Care Systems Development.

As described in the Direct Care sections for both the perinatal and the child and adolescent populations, local public health agencies are finding it necessary to continue to provide direct prenatal care services or direct child health care services in many communities because resources are not adequate to meet needs. However, local public health agencies are increasingly providing leadership to address the lack of resources rather than simply continuing to meet a small part of the needs. Local health agencies are helping to assess the needs, convening or participating in community-based planning groups which are to include community health centers where possible, and monitoring the impact of changes in the health care provider systems. The new MCH assessment and planning system encourages local agencies in this important assurance role. We need to expand cooperative assessment and planning efforts with the Colorado Community Health Network at the state level and with the community health centers at the local level. At the state level we need to continue to develop the capacity to collect and distribute data which is community-level data to support local agencies in these efforts. The capacity to identify disparities among racial or ethnic or other minority or underserved populations through data is work that the state needs to continue and to carry forward through policy development and programmatic interventions.

Impact of Tobacco Settlement Legislation

The Colorado Legislature spent two years, 1999 and 2000, developing its plan for use of the state's Tobacco Settlement monies. A portion of the funding will be used for nurse home visitation for at-risk low-income women expecting their first child (3 percent of funds increasing to 19 percent), a portion will go to youth tobacco-use prevention, cessation, and education (15 percent), and a portion will go to the addition of a dental program in the Child Health Plan Plus (10 percent). A total of \$100 million annually should be available for 25 years for the entire settlement, which includes other allocations for literacy programs and veterans.

Infrastructure building activities for the perinatal population.

Coordination with Medicaid and Managed Care Plans

A priority for the Women's Health Program is to strengthen its cooperative working relationships with Medicaid managed care organizations in the operation of the Prenatal Plus Program. This is important because one-third of all births are now covered by Medicaid and over half of all Medicaid recipients are now in managed care plans. The Prenatal Plus Program provides multi-disciplinary counseling and support services to high-risk pregnant women who are Medicaid recipients, and is described under Enabling Services for Perinatal Populations. The emphasis for improving the working relationships with managed care organizations is on providing education regarding the program and its benefits to the managed care plan prenatal care providers to promote referral of high-risk women to Prenatal Plus. Protocols for systems of referral have also been developed. Infrastructure building activities also include attempts to secure improved Medicaid reimbursement rates through the legislature because the current rates are well below the actual costs of the services. Attempts also include efforts to secure supplemental funding from the managed care organizations themselves.

Medicaid waiver for Family Planning services

Another infrastructure building activity of the Women's Health Section is the application for a waiver, submitted to the Health Care Financing Administration in February 2000, to expand Medicaid coverage for family planning services to couples and individuals whose income is less than 150 percent of the federal poverty level. This is another cooperative initiative with the Department of Health Care Policy and Financing.

Impact of PRAMS Data

Colorado has been fortunate to have the PRAMS (Pregnancy Risk Assessment Monitoring System) project that was begun in October 1996. Data are available for 1997 and 1998 from surveys of Colorado women giving birth that provide additional information supplementing birth certificate data. This project provides a vast resource for answering questions about this group of women and the care they received while pregnant. The Health Statistics Section provides rapid and helpful analysis on all topics covered in the survey when requests are made by the Family and Community Health Services Division.

The information gained from PRAMS has been pivotal in our understanding of prenatal and perinatal care. Since the fall of 1998, we have made a quantum leap in our understanding of numerous prenatal and infant care issues. We have been able to analyze the differences in

responses according to whether women received Medicaid or not, a difference which is significant in virtually every variable.

Analysis of the information was undertaken by the Women's Health Section with the assistance of the Health Statistics Section. The first four-page brief was developed and disseminated to a wide professional audience in March 1999. Titled, "An overview of pregnancy experiences: 1997 data from the Colorado Pregnancy Risk Assessment Monitoring System (PRAMS)," it described pregnancy intendedness, prenatal care, health insurance, smoking, alcohol use, physical abuse, stressful life events, maternal mental health, maternal weight gain, breastfeeding, and sleep position practices among Colorado women giving birth in 1997.

During FY 99, other topics analyzed included Medicaid/non-Medicaid comparisons, WIC/non-WIC comparisons, and regional differences (on a county or grouped county basis) made possible by the availability of two years of data. In November 1999, a second brief was published, "Breastfeeding Initiation: 1997 data from the Colorado Pregnancy Risk Assessment Monitoring System."

PRAMS data have been provided to the Colorado Department of Health Care Policy and Financing in an effort to pass legislation to allow Medicaid coverage of prenatal care for women who are undocumented workers. The number of women in this category has increased from an estimated 3,000 in FY 98 to 4,000 in FY 01 out of a total of about 60,000 births per year. These numbers have increased very rapidly, especially since the early 1990's, and the poor prenatal care experience of these mothers appears to be keeping the state's first trimester care proportion from rising; in 1998 the percentage dropped after ten years of increase. PRAMS data also showed that babies born to women *without* prenatal care coverage averaged 5.1 nights in the hospital vs. 2.6 nights for babies born to women *with* prenatal care coverage. The 2000 Legislature passed a bill that allows managed care organizations to provide prenatal care coverage using Medicaid funding. However, no increase was provided, based on the premise that money would be saved in hospitalization costs for infants whose mothers received appropriate and early prenatal care.

Infrastructure building activities for the Child and Adolescent population

A major focus of the child and adolescent program is the interagency coordination on the Child Health Plan Plus. This work was largely carried by the Covering Kids Initiative, a Robert Wood Johnson Foundation-funded grant administered by the Child Health Director, to promote access to the valuable services of the Child Health Insurance Program through community initiatives. Three pilot sites in the state, all with local public health leadership, are testing methods to ensure that eligible children are enrolled. They include Denver, Adams County (a large, metro area county with extremes in income level and racially and ethnically diverse populations) and Prowers County, a rural county on the eastern plains with a committed partnership of a community health center, county public health nursing and county social services agency. In addition to the Covering Kids Initiative, there are several policy board sub-committees convened by the administering agency, the Department of Health Care Policy and Financing, upon which local and state program staff from our oral health, child and adolescent, HCP and SSDI programs are actively participating. They are addressing such issues as eligibility processes which impede enrollment, design of a simplified combined Medicaid and CHP+ application, and methods of

marketing.

Child Care

Infrastructure activities around child care are described in the State Performance Measure 4 Annual Plan section on page 130.

Advisory Council on Adolescent Health

The state Advisory Council on Adolescent Health is an interdisciplinary group of experts and community advocates for adolescent health that was commissioned in 1982. The Council is actively involved in the development of Colorado's periodic reports on the status of adolescent health, in advising the Department on programs and policies related to adolescent health, and in using the reports/data to educate and advocate for adolescent health needs.

Oral Health

The Oral Health Program continues to work with Medicaid EPSDT and the Colorado Dental Association to develop health education materials for families and provider education for Medicaid participation. An influential senator on the Joint Budget Committee of the Legislature is serving on the Commission for Children's Dental Health to assure a network of providers is in place before supporting the dental benefit in the state children's health insurance program.

Infrastructure Building Activities for Children with Special Health Care Needs

The description of these activities is contained in the following four "constructs," as requested by the guidance.

Construct # 1: State Program Collaboration with Other State Agencies and Private Organizations

Score: 2 (Mostly Met)

Colorado has a number of strong interagency collaborative processes in place for the assessment of needs with respect to the development of community-based systems of services for children with special health care needs. Many interagency groups are long-standing (particularly those that traditionally have focused on coordinating publicly funded programs) while some groups are new and include new partners (such as those that focus on issues of managed care and tele-medicine.)

One strong interagency group continues to be the Colorado Interagency Coordinating Council for Part C. A subgroup, with representatives from the five state agencies that have signed the Part C Memorandum of Understanding, meets on a monthly basis to discuss policies, funding, data and program issues for children eligible for Part C services. These agencies include the Colorado Departments of Education, Human Services (which includes child welfare, foster care, developmental disabilities and TANF), Health Care Policy and Financing (which includes Medicaid and the state child health insurance plan), Public Health and Environment, and the Insurance Commission. The focus for the past year has been the self-assessment for the Federal audit done by the Office of Special Education, which took place in January 2000. Developing a plan to respond to the findings of that audit will be the work for this next fiscal year.

Another area of particularly strong collaboration is the system for identification and intervention for children from birth to three years who are hard of hearing or deaf. Traditional partners have included the Colorado Department of Public Health & Environment, Colorado Department of Education, Colorado Department of Health Care Policy and Financing, the Marion Downs National Center for Infant Hearing at the University of Colorado at Boulder, Families for Hand and Voices, Family Voices, Children's Hospital and the University of Colorado Health Sciences Center. A relatively new partner in the effort to enhance community systems of care (though not new to the care of children with hearing loss) is the Colorado School for the Deaf and Blind. This new and important emerging connection with the School has been chiefly fostered through the leadership of the HCP staff.

The Newborn Hearing System of Screening and Intervention is chiefly organized through the efforts of the Colorado Infant Hearing Advisory Committee, which is housed at the state health department. Many coordinated policies and standards developed by task forces of the Advisory on screening, assessment and early intervention have been adopted. Regional Co-Hears (Colorado Hearing Resource Coordinators) and Audiology Regional Coordinators funded through HCP are responsible for promoting the policies and standards throughout the state as well as assuring that infants who are identified with hearing loss return for assessment and intervention, as necessary. The Newborn Hearing Data Management System is close to completion and will capitalize on the electronic birth certificate in use in Colorado and provide the needed tracking to monitor the system.

Relationships continue to be good with the Colorado Department of Health Care Policy and Financing. Staff meets regularly to discuss Medicaid and CHP+ policy and program issues. Formally, we have an agency-level Memorandum of Understanding as well as program level contracts for services. Various staff from both HCP and from the Department of Health Care Policy and Financing sit on a number of advisory groups, work groups and committees convened by both agencies.

HCP continues to share two positions (a Social Work Consultant and a Rehabilitation Consultant) with JFK Partners—the University Affiliated Program in Colorado. These shared positions have assured the close working relationship between the two agencies as well as the staff support for a number of joint projects. Of particular significance this year have been the expanded educational offerings to staff in local health agencies as well as to community providers through tele-health opportunities that have been jointly planned and funded by the two agencies. The JFK Key Concepts Lecture series was seen by video in eight communities across the state. Another joint project was the initiation of a pilot tele-medicine clinic in rural Colorado. A neurology clinic was held at St. Mary's Hospital in Grand Junction on the Western Slope and linked to a pediatric specialist in Denver at the Children's Hospital. The Mesa County Department of Health and staff from JFK Partners and HCP provided leadership in pulling together the hospital and the predominant HMO in the area to financially support the effort.

The RWJ-sponsored Safety Net Project located in the Colorado Department of Health Care Policy and Financing brought together a number of key players (both public and private) in

developing model contracts, standards and policies. This was done to assure quality care coordination services for children with special health care needs in Medicaid managed care organizations. The relationships developed during the numerous task force meetings are chiefly responsible for the HMOs' interest in contracting with HCP to provide care coordination by local public health staff to families with children with special needs.

A statewide needs assessment of children with special health care needs in the child protective and foster care systems and of mental health services was done by HCP in the spring of 1999. The assessment was distributed widely at the state and local levels. The assessment provided a good starting point for many communities to begin discussions. In the Denver metro area a taskforce was formed comprised of community agencies which serve the needs of people with developmental disabilities. The purpose of the group has been to identify the needs of children and adults with dual developmental and mental health diagnoses, and to come up with possible ways of addressing the gaps in services. The group was convened by the mental health service component of Colorado Access (Access Behavioral Care or ABC) by their special needs advocate.

There are many other interagency efforts. The Department of Education, JFK Partners (the University Affiliated Program in Colorado) and HCP continued to provide training in six new communities around the state on ADD/ADHD. HCP also participated with other state agencies in the Part C monitoring effort called the Community Infant Services Review in five communities. A collaborative effort around planning for Traumatic Brain Injury Needs Assessment spurred a number of new planned activities including the revision of a Traumatic Brain Injury Manual for teachers, a project to educate parents, the development of a library of materials, and a project to uncover more data on the incidence and followup rates for children with traumatic brain injury. A comprehensive cross agency state plan will be developed next year. A task force with members from the Children's Hospital, the Colorado Department of Education, the Colorado Department of Public Health & Environment, the University of Colorado Health Sciences Center and the Colorado School for the Deaf and Blind is working to create statewide guidelines for the use of Assistive Technology devices.

Construct # 2: State Support for Communities

Score: 2 (Mostly Met)

The Health Care Program for Children with Special Needs (HCP) places strong emphasis in supporting the facilitation of community systems building, both financially and through personnel resources for technical assistance, consultation and training. To assure broad and comprehensive systems at the community level we continue to focus on the implementation of multi-disciplinary teams as a primary strategy of support in Colorado. State discipline consultants (in nursing, nutrition, social work, parent advocacy, physical therapy, speech pathology, audiology and early intervention for hearing loss) support similar discipline coordinators in the thirteen regional offices. State consultants and regional discipline coordinators provide technical assistance, training and consultation to county public health entities, 1) on programmatic issues (such as direct service eligibility criteria or standards of care), 2) on clinical discipline issues (such as

competency of local providers or new technology) and 3) on community issues (such as how to work with the local managed care organizations to assure pediatric specialty services to its members with special needs by helping to plan and fund local outreach clinics in rural areas.)

During FY 99 HCP increased its financial commitment to the regional offices to assure adequate staffing to work with the new state child health insurance plan at the local level to assure that families could access the new services. Local HCP staff worked diligently to provide care coordination services to families; to enroll children in CHP+; to find the right managed care organization for each child's particular needs; to assure community-based pediatric specialty providers; and to coordinate the care between the primary care providers and the specialists when that was necessary.

Financial support was also given to regional offices for education and training of local staff. Especially exciting this year was the number of topics that were sent out to communities via tele-health so that local family doctors and their staffs, therapists, equipment vendors, school and hospital personnel as well as public health staff could participate in the workshops. Topics included: "Language and Learning," "Traumatic Brain Injury," "ADD/ADHD," "Nutrition and Children with Spina Bifida," "Developmentally Supportive Care by Nurses," and "Sensory Integration."

HCP also supported a number of workshops in conjunction with other state agencies including the annual Children's Hospital Community Health Traineeship and a workshop on Service Coordination. A more complete listing of the training for providers, agencies, and family and community members conducted or sponsored by HCP appears in Section 5.3, Other Supporting Documents.

Lastly, the implementation of the IRIS data system (including the design, development, testing, training, installation, technical assistance, monitoring and problem solving efforts) was a major example of support to communities. This system was developed over a multi-year period in conjunction with regional and local staff. Local user needs were paramount in the design efforts, and the users were involved in the testing and in the revisions of the system. Local users now have access to information about the clients that they serve and can run needed community level reports for their county commissioners, agency health officers and community groups.

Construct # 3: Coordination of Health Components of Community-Based Systems
Score: 2 (Mostly Met)

The major mechanism in communities across the state for coordination of health services with one another is through Care Coordination efforts at the community level. Public health nurses with the support of their multi-disciplinary teams at the regional level work to assure that there is coordination among the services needed by families and children with special health care needs. While Care Coordination is child and family focused, the knowledge gained about gaps and barriers in the community system of health care is used to support efforts of community level interagency collaboration.

HCP-funded regional multi-disciplinary teams work across community programs and agencies to assure coordination among services and providers. The regional discipline coordinators work part-time for HCP and are usually employed in other community health, education, mental health and social services agencies and organizations. The hospital dietitian, the school speech therapist, the community centered board physical therapist and the private occupational therapist who works with Part C may all be HCP regional discipline coordinators who assist the local HCP nurses in finding and coordinating resources for families. They also assure that all the right agencies and organizations are at the table when community health system building is discussed.

HCP clinics are also instrumental in coordinating health services with one another in rural areas. HCP pays for pediatric specialty providers to attend clinics where specialists and subspecialists are not available. Local public health nurses coordinate the clinics and assure followup services using the multi-disciplinary teams after the clinician returns to a metropolitan area. Local HCP staff work to assure the HCP specialists are in the managed care organization's provider network and that coordination among the primary care providers, the clinic specialists and the families is taking place.

As the number of children with special needs grows in rural areas, and as more and more children are covered by the state child health insurance plan and Medicaid through managed care organizations, local HCP staff are working with the managed care organizations, local hospitals, community health centers and other community stakeholders to look at ways to improve the access to pediatric specialty care and share the expense of funding the outreach clinics. In some areas this collaboration includes looking at the potential of holding clinics or consultation via tele-medicine. These new public/private partnerships between hospital corporations, rural health tele-medicine grantees, managed care organizations, state and local public health agencies and a tertiary hospital to use video equipment for clinics are exciting new ways to provide improved access to care to children.

Many communities have local Newborn Hearing Screening and Intervention Consortia or Taskforces. With leadership from the HCP Co-Hear or Audiology Regional Coordinators, the groups bring together hospital personnel, private doctors, community health center staff, public health nurses and child find staff to assure that followup occurs for all children who fail the screening tests in the hospital.

There is also a local Neonatal Intensive Care Unit (NICU) Consortium in many communities. These groups consist of Part C coordinators, child find staff, home health agency representative and community centered board case managers who work to coordinate efforts while providing developmentally supportive care to "NICU grads" in the community. In many areas HCP nurses provide the leadership for the groups facilitating quarterly meetings to provide support and education for the groups.

HCP continues to support a Community Resource Nursing Consultant at the Children's Hospital. This position has been extremely popular with the public health nurses. Some responsibilities of this position include assuring that families receive assistance in finding meals and lodging while

their children are hospitalized in Denver; assisting families in registering for HCP direct services, Medicaid, CHP+ and SSI; assuring a discharge plan has included the community providers; helping connect Spanish-speaking-only families with interpretation during hospital and clinic visits; and coordinating efforts in the NICU at getting the initial Part C-required IFSP (Individual Family Service Plan) in place. One new project is the initiation of a taskforce to make access to care in the hospital and its outpatient clinics easier for non-English speaking families. The first activity is to assure all signs in the hospital are in Spanish in addition to English.

HCP local staff has been involved in working to establish community support for Satellite Eligibility Determination Sites for the Colorado Child Health Plan Plus. In some cases HCP local staff has also staffed the sites to help assure that families get enrolled quickly. Most HCP regional offices also have staff who make telephone calls to follow up on CHP+ applications where one of the “special needs questions” has been marked. When an urgent need is identified, the managed care organization or primary care physician is notified immediately. And lastly, they provide assistance for families when children no longer qualify for Medicaid by helping them get enrolled in CHP+ as quickly as possible. This effort has been particularly frustrating, as there is no automatic notification of the managed care organization or of the state CHP+ when this occurs.

Construct # 4: Coordination of Health Services with Other Services at the Community Level

Score: 2 (Mostly Met)

Local HCP public health staff work especially closely with Part C coordinators to assure that early intervention services are coordinated. Almost all HCP staff sit on local interagency councils and work to establish systems of identification, follow up on individual needs, set policy, conduct community needs assessments and write collaborative grant proposals for needed community programs. The Colorado Department of Education has hired professional staff in three of the HCP regional offices as Part C Service Coordination Mentors. In this role they are responsible for assisting other Service Coordinators in their communities. They also are involved in developing a set of standardized competencies, with an accompanying training program, that all Service Coordinators working with Part C will meet.

Most HCP local staff is also involved in other interagency work such as serving on child protection teams and in working with school districts to support parents in special education staffings and the development of IEPs (Individual Education Plans) or IFSPs. Many serve on boards and advisory groups for mental health agencies and initiatives, community centered boards, family or parent-to-parent support groups, lay home visiting programs, breastfeeding taskforces, respite care initiatives and family resource centers. Some work closely with immigration officials and transportation initiatives for people with disabilities.

Several of the Parent Advocates or Social Workers on the regional HCP teams have begun producing newsletters for parents and the community on the issues of children with special health care needs in their communities. Other staff have developed and produced community-specific brochures and pamphlets that describe programs available to families.

3.2 Health Status Indicators

Reporting on data for Health Status Indicators, submitted on Forms C1, C2, C3, and D1 and D2, are new with this grant for FY 01. We have been able to submit data on most of the requested topics, which are described very briefly below.

Form C1 contains Health Status Indicators # 01 through # 05.

Health Status Indicator #01 Ambulatory Sensitive Condition

The rate per 10,000 for asthma hospitalizations among children less than 5 years old.

These data are discussed on beginning on page 66 in the Needs Assessment Health Status section.

Health Status Indicator #02 A Adequacy of Primary Care

The percent Medicaid enrollees whose age is less than one year during the reporting year who received at least one initial periodic screen

The level for Colorado Medicaid enrollees was 68.8 percent in FY 95, and increased to 81 percent in FY 96 and FY 97. In FY 98 it was 79.8 percent; in FY 99 it rose to 89.4 percent. Since FY 95, this indicator has jumped by twenty percentage points, from 68.8 percent to 89.4 percent.

Health Status Indicator # 02 B Adequacy of Primary Care

The percent Children's Health Insurance Program enrollees whose age is less than one year during the reporting year who received at least one periodic screen.

The Child Health Plan Plus is not able to provide this information at this time.

Health Status Indicator #03 Prenatal Care Participation

The percent of women (15 through 44) with a live birth during the reporting year whose observed to expected prenatal care visits are greater than or equal to 80 percent on the Kotelchuck Index

Data are available for calendar 1995 through calendar 1998. In 1995, the rate was 69.3 percent; in 1996, it was 70.8 percent; in 1997 it rose to 71.8 percent, but in 1998 it was 70.6 percent. This percent does not appear to be changing in any real way. The data suggest that only 7 out of every 10 women receive appropriate prenatal care measured by when prenatal care began and the number of visits.

Health Status Indicator # 04 A Low Birth Weight

The percent of live births weighing less than 2,500 grams.

Data are provided for calendar 1994 through calendar 1998. The rate was 8.5 percent in 1994 and 1995; 8.9 percent in 1996 and 1997, and 8.7 percent in 1998. Low birth weight is considered to be one of Colorado's biggest maternal and child health problems. An analysis of the problem is provided in the Health Status section of this application and in the full report, *Tipping the Scales: Weighing in on Colorado's Low Birth Weight Problem*, (Section 5.3, Other Supporting Documents). A number of solutions are proposed which could reduce the state's rate if widely adopted.

Health Status Indicator # 04 B Singleton Low Birth Weight

The percent of all live singleton births weighing less than 2,500 grams.

Data are provided for calendar 1994 through calendar 1998. The rate was 7.1 percent in 1994, 6.9 percent in 1995, 7.2 percent in 1996 and 1997, and 6.9 percent in 1998. Colorado's singleton rate is high. The report mentioned above under Health Status Indicator # 04 A contains a population attributable risk analysis focused on singleton births, revealing that inadequate weight gain and smoking during pregnancy are major factors in the high level, and that premature rupture of membranes also plays a significant role.

Health Status Indicator # 05 A Very Low Birth Weight

The percent of very low birth weight live births.

Data are provided for calendar 1994 through calendar 1998. The rate was 1.3 percent in every year except 1995, when it was 1.2 percent. Colorado's rate is similar to the U.S. rate; it is not higher than other states' rates.

Health Status Indicator # 05 B Singleton Very Low Birth Weight

The percent of very low birth weight live singleton births

Data are provided for calendar 1994 through calendar 1998. The rate was 0.9 percent from 1994 through 1996; it rose to 1.0 percent in 1997 and 1998.

Form C2, covering Core Health Status Indicators #06 and 07, contains low birth weight, infant death, trimester care began, and Kotelchuck Index information on the Medicaid and non-Medicaid populations in 1998. The information provided for all births is vital statistics data; the percentages shown for the Medicaid and non-Medicaid populations are estimated using PRAMS (Pregnancy Risk Assessment and Monitoring System) data for 1998. Discrepancies between overall birth certificate rates and PRAMS-calculated rates are to be expected, due to sampling and other errors, and are not significant.

Core Health Status Indicator #06

Medicaid and Non-Medicaid Comparison

Medicaid births had a 9.1 percent low birth weight rate (7.8%-10.4%; 95% confidence intervals), while non-Medicaid births had a 7.3 percent low birth weight rate (6.9%-7.7%; 95% confidence intervals). The rate for Medicaid births is significantly higher than for non-Medicaid births. The PRAMS total for both types of coverage was 7.8% (7.6%-7.9%; 95% confidence intervals); this is lower than the vital statistics birth certificate rate of 8.7 percent.

Infant death rates are not available for Medicaid/non-Medicaid populations. Colorado does not collect Medicaid information on the birth or death certificate. The overall infant death rate is 6.7 percent. Infant mortality is discussed in the Health Status section on page 63.

The percent of pregnant women entering care in the first trimester is calculated at 69.5 percent (64.3%-74.7%; 95% confidence intervals) for Medicaid births, using PRAMS data. The percent for non-Medicaid births is 88.7 (86.6%-90.8%; 95% confidence intervals) for non-Medicaid births, a rate that is significantly higher. Vital statistics data show an overall rate of 82.2 percent, but PRAMS data for the entire group are 83.5 percent (81.4%-85.6%), slightly higher.

The percent of pregnant women with adequate prenatal care (observed to expected prenatal visits is greater than or equal to 80% [Kotelchuck Index]) among Medicaid births was estimated to be 63.7 percent (58.3%-69.2%; 95% confidence intervals) according to PRAMS data and 77.1% (74.3%-80.0%; 95% confidence intervals) among non-Medicaid births. The Medicaid rate is significantly lower than the non-Medicaid rate. The rate for all births using PRAMS data was 73.5% (71.0%-76.0%; 95% confidence intervals), while the rate using vital statistics data was 70.6 percent, slightly lower.

Core Health Status Indicator # 07

Medicaid and CHIP eligibility levels

The percent of poverty level for eligibility in Colorado's Medicaid plan is 133 percent for infants and children less than or equal to 5, and pregnant women. The rate drops to 100 percent for children 6 to 16. An assets test is required for all children age 1 or older, but not for pregnant women or infants. The state Child Health Plan Plus percent of poverty level is 185 percent.

Form C3 contains information on Core Health Status Indicator # 08.

Core Health Status Indicator # 08

State Maternal and Child Health data capacity

This form rates the ability of the state to assure MCH program access to policy and program relevant information. The MCH program has ready access to birth and infant death certificate linkage and to PRAMS data, and some access to hospital discharge, Youth Risk Behavior, and birth defects surveillance system data. There is no annual linkage of Medicaid paid claims and birth certificate data, or of WIC and birth data, or of newborn screening and birth data.

Form D1 contains information on Developmental Health Status Indicators # 01 through 05.

Developmental Health Status Indicator # 01 A Fatal Unintentional Injuries

The death rate per 100,000 due to unintentional injuries among children aged 14 years or younger
Data are available for calendar 1994 through 1998. The death rate was 9.5 in 1994, 9.9 in 1995 and 1996, 10.2 in 1997 and 10.1 in 1998. The rate appears to be increasing slightly.

Developmental Health Status Indicator # 01 B Fatal Unintentional Injuries

The death rate per 100,000 from unintentional injuries due to motor vehicle crashes among children aged 14 years or younger

Data are available for calendar 1994 through 1998. The death rate was 5.4 in 1994, 6.3 in 1995, 5.8 in 1996, 4.6 in 1997 and 4.3 in 1998. The rate has been decreasing since 1995. This measure is very similar to National Performance Measure # 8, which is the motor vehicle death rate for children 1 to 14, a rate that has declined in recent years.

Developmental Health Status Indicator # 01 C Fatal Unintentional Injuries

The death rate per 100,000 from unintentional injuries due to motor vehicle crashes among youth aged 15 through 24 years

Data are available for calendar 1994 through 1998. The death rate was 31.6 in 1994, 29.7 in 1995, 30.4 in 1996, 27.8 in 1997 and 26.3 in 1998. The rate appears to be decreasing. This measure is very similar to State Performance Measure # 5, which is the motor vehicle death rate for children 15-19, a rate that continued a decline in 1998 to its lowest level in Colorado at least since 1980.

Developmental Health Status Indicator # 02 A Non-Fatal Unintentional Injuries

The rate per 100,000 of all nonfatal injuries among children aged 14 years or younger

Data are available for hospitalizations for children in calendar 1996 through 1998. The hospitalization rate was 244.7 in 1996, 241.6 in 1997, and 230.6 in 1998. The rate appears to be decreasing slightly. It is at a level of approximately 24 hospitalizations to 1 death due to unintentional injuries.

Developmental Health Status Indicator # 02 B Non-Fatal Unintentional Injuries

The rate per 100,000 of nonfatal injuries due to motor vehicle crashes among children aged 14 years or younger

Data are available for hospitalizations for children in calendar 1996 through 1998. The hospitalization rate was 46.0 in 1996, 43.3 in 1997, and 40.8 in 1998. The rate appears to be decreasing. It is at a level of approximately 9 hospitalizations for every 1 death due to motor vehicle crashes in this age group.

Developmental Health Status Indicator # 02 C Non-Fatal Unintentional Injuries

The rate per 100,000 of nonfatal injuries due to motor vehicle crashes among youth aged 15 through 24 years

Data are available for hospitalizations for youth 15 through 24 in calendar 1996 through 1998. The hospitalization rate was 184.6 in 1996, 198.8 in 1997, and 183.0 in 1998. The rate appears to be variable, and at a level of approximately 7 hospitalizations for every 1 death in this age group due to motor vehicle crashes.

Developmental Health Status Indicator # 03 A Sexually Transmitted Disease (Chlamydia)

The rate per 1,000 women age 15 through 19 years with a reported case of chlamydia

Reported cases of chlamydia yielded a rate of 17.0 in 1996, 18.3 in 1997, and 22.3 in 1998. The rate appears to be increasing.

Developmental Health Status Indicator # 03 B Sexually Transmitted Disease (Chlamydia)

The rate per 1,000 women age 20 through 44 years with a reported case of chlamydia
Reported cases of chlamydia yielded a rate of 3.7 in 1996 and 1997, and 4.9 in 1998. The rate appears to have increased in 1998.

Developmental Health Status Indicator # 04 Medicaid EPSDT Dental Health Services

The percent of EPSDT eligible children aged 6 through 9 years who have received any dental services during the year

Data are available only for FY 98 from HCFA Form 416. Out of 33,633 children eligible for EPSDT services ages 6 through 9, almost half (44.7 percent) received a dental service.

Developmental Health Status Indicator # 05 Adolescent Tobacco Use

The percent of adolescents in grades 9 through 12 who reported using tobacco products in the past month

Weighted data are available from the Colorado Youth Risk Behavior Survey only for 1995, when the level was 22 percent. This indicator is the same as Colorado's State Performance Measure # 6.

Form D2 contains a variety of demographic data.

Developmental Health Status Indicator # 06 A and B Demographic Data

Total Population of Infants and Children by Age and Race/Ethnicity

This form shows the population of children from 0 through 24 broken down by age and race/ethnicity. Colorado had a total of 1,492,626 children through age 24 in 1998, with 1,347,215 classified as White, 70,674 classified as Black, 14,852 classified as American Indian or Native Alaskan, 36,758 classified as Asian and 23,127 classified as Other or Unknown. A total of 246,054 were estimated to be Hispanic.

Developmental Health Status Indicators # 07 A and B Demographic Data

Total Births by Age of Mother and Race/Ethnicity

This form shows a total of 59,550 births in 1998, broken down further by age of mother and race/ethnicity.

Developmental Health Status Indicators # 08 A and B Demographic Data

Total Deaths Among Children age 0 through 24 by Race/Ethnicity

This form shows a total of 1,038 deaths to children in 1998, broken down further by age and race or ethnicity.

Developmental Health Status Indicators # 09 A and B Demographic Data

Infants and children aged 0-19 in miscellaneous situations or enrolled in various State programs enumerated by Race/Ethnicity

The percent of children in households headed by single parents, the percent in TANF Grant families, the number in CHIP, living in foster home care, etc. are displayed in this table.

Developmental Health Status Indicators # 10 Demographic Data

Geographic living area for all children aged 0 through 19 years

The number of children living in metropolitan areas, urban areas, rural areas, and frontier areas are displayed in this table. Data are available only from the 1990 Census.

Developmental Health Status Indicators # 11 Demographic Data

The percent of the State population at various levels of the federal poverty level

The percents of the population living at 50 percent, 100 percent, and 200 percent of poverty are displayed in this table. According to 1990 Census data, 5.1 percent of Colorado's population were at the lowest level, 11.7 percent were at 100 percent of poverty, and 29.3 percent were at 200 percent of poverty.

Developmental Health Status Indicators # 12 Demographic Data

The percent of the State population aged 0 through 19 at various levels of the federal poverty level

The percents of children living at 50 percent, 100 percent, and 200 percent of poverty are displayed in this table. According to 1990 Census data, 5.0 percent of Colorado's children were at the lowest level, 15.0 percent were at 100 percent of poverty, and 30.2 percent were at 200 percent of poverty.

3.2.1 Priority Needs

Between November 1999 and February 2000, a review was carried out of the ten priority areas Colorado had chosen in 1998, shown here:

1. Reduce teen pregnancy and unintended pregnancy in women of all ages
2. Improve perinatal outcomes
3. Reduce child and adolescent morbidity
4. Increase health and safety in child care settings
5. Improve efforts to reduce unintentional and intentional injury, addressing motor vehicle crashes, suicide, child abuse, and other violence
6. Improve immunization rates for all children
7. Increase access to health care (including behavioral health care)
8. Improve state and local infrastructure by increasing capacity to analyze data, carry out evaluations, develop quality standards, and assure availability of services to all women and children, including children with special health care needs
9. Reduce substance abuse (alcohol, tobacco, and drugs)
10. Improve oral health and access to oral health care.

The Advisory Council on Health Programs for Women and Children decided to retain the above list, and to review the results of the Year 2000 Needs Assessment in the fall of 2000. Decisions about changing priorities would be deferred until after the grant application was submitted for FY 01. Therefore, the priorities chosen in 1998 were kept for FY 01, but may be changed for FY 02.

3.3 Annual Budget and Budget Justification

3.3.1 Completion of Budget Forms

Budget forms 2, 3, 4, and 5 are in the Supporting Documents Section. On Form 2, because of the design of the underlying Electronic Reporting Package software, a warning appears, "State match is not at least ¾ of the Federal Allocation." However, state plus local funds meet the ¾ requirement. Also on Form 2, a number of separate programs under the control of the Family and Community Health Services Division Director are shown under item 8, line k, "Other." The breakdown of line k is:

<u>Program</u>	<u>FY 01</u>
Maternal/Infant Mortality Review	\$170,753
Regional Genetics Network	371,075
Farmworker Health Services	
Health and Human Services	976,742
Primary Care Cooperative Agreement	138,805
Family Planning Title X	2,107,295
Critical Access Hospital	382,705
Dept. of Education Part B, C, HCP, School Nursing	108,712
Preventive Block for Fluoridation	67,927
PRAMS	112,524
Water Fluoridation	37,657
Search	<u>145,000</u>
	\$4,619,195

We have not included in the above listing the Medicaid funding which has a mix of state funds and federal funds, with the mix varying by type of program. Those Medicaid funds for FY 01 are:

Early and Periodic Screening, Diagnosis And Treatment (EPSDT)	\$2,951,670
Prenatal Plus	66,056
Orthodontic care (HCP)	<u>592,524</u>
	\$3,610,250

Form 5 reveals a large shift away from expenditures under Direct Health Care over time. In FY 98 the expenditures for direct health care equaled 34.3 percent of the total federal-state Block Grant Partnership; in FY 99 the share dropped to 30.4 percent of expenditures, in FY 00, 24.2 percent are budgeted, and in FY 01, 23.0 percent are budgeted. Enabling services also show a large increase over time, from 21.5 percent of FY 98 expenditures to 34.5 percent budgeted for FY 01. Population-based services show an increase as well from about 15 percent in FY 98 and FY 99, up to 20.1 percent budgeted for FY 01. Infrastructure-building service monies show a good deal of variability; from 29.4 percent of FY 98 expenditures, to 32.7 percent of FY 99 expenditures, and then dropping to 22.4 percent of the FY 01 budget.

3.3.2 Other Requirements

The maintenance of effort dollars from 1989 for Colorado total \$4,736,061. For the expended federal amount for FY 99 of \$7,603,990, the state match, which excludes local funds, was \$5,486,961. The state match exceeded the maintenance of effort requirement by \$750,900.

For the application year FY 01 for federal funds of \$7,674,200, the estimated state match, again excluding local funds, is anticipated to be \$5,067,218, which exceeds the maintenance of effort requirement by \$331,157. The state match for FY 99, \$5,486,961, was made up of \$4,620,252 of state funds, \$856,727 of cash funds supporting genetics counseling, and \$9,982 of other cash funds representing patient fees (based on a sliding fee scale) of families above 100 percent of the federal poverty level. The state match estimated for FY 01, \$5,067,218, consists of \$4,128,424 of state funds, \$899,339 of cash funds supporting genetics counseling, and \$39,455 of other cash funds representing patient fees from families above 100 percent of the poverty level.

In addition to the above state match related to the maintenance of effort requirement, there are local/county dollars totaling \$216,032 in FY 99 and \$688,447 in FY 01 that support prenatal and child health activities conducted at the local health departments.

3.4 Performance Measures

In 1993, the Government Performance and Results Act (GPRA) mandated the use of performance measures. This application for FY 01 is the third year these measures have been used.

Figure 3 on page 8 is a schematic drawing of how the Maternal and Child Health Bureau views the "Performance Measurement System." Essentially, the state's ten priorities are addressed through the four levels of service shown in the pyramid. Each of the national and state performance measures is assigned to a level of the pyramid, according to the type of activity (direct service, enabling, population-based, or capacity and infrastructure) that the state will pursue toward the attainment of the measure. The performance measures themselves are also labeled as "capacity," "process," or "risk factor," again according to the content of the measure. The last column on the right shows that the performance measures are expected to have an impact on a variety of outcomes like infant mortality or child death.

3.4.1 National “Core” Five Year Performance Measures

There are eighteen national “core” performance measures. These are shown in Figure 4 on pages 114 and 115.

3.4.1.1 Five Year Performance Targets

The five-year performance targets set for the national “core” performance measures are shown on Form 11, which is in Section 5.4.

3.4.2 State “Negotiated” Five Year Performance Measures

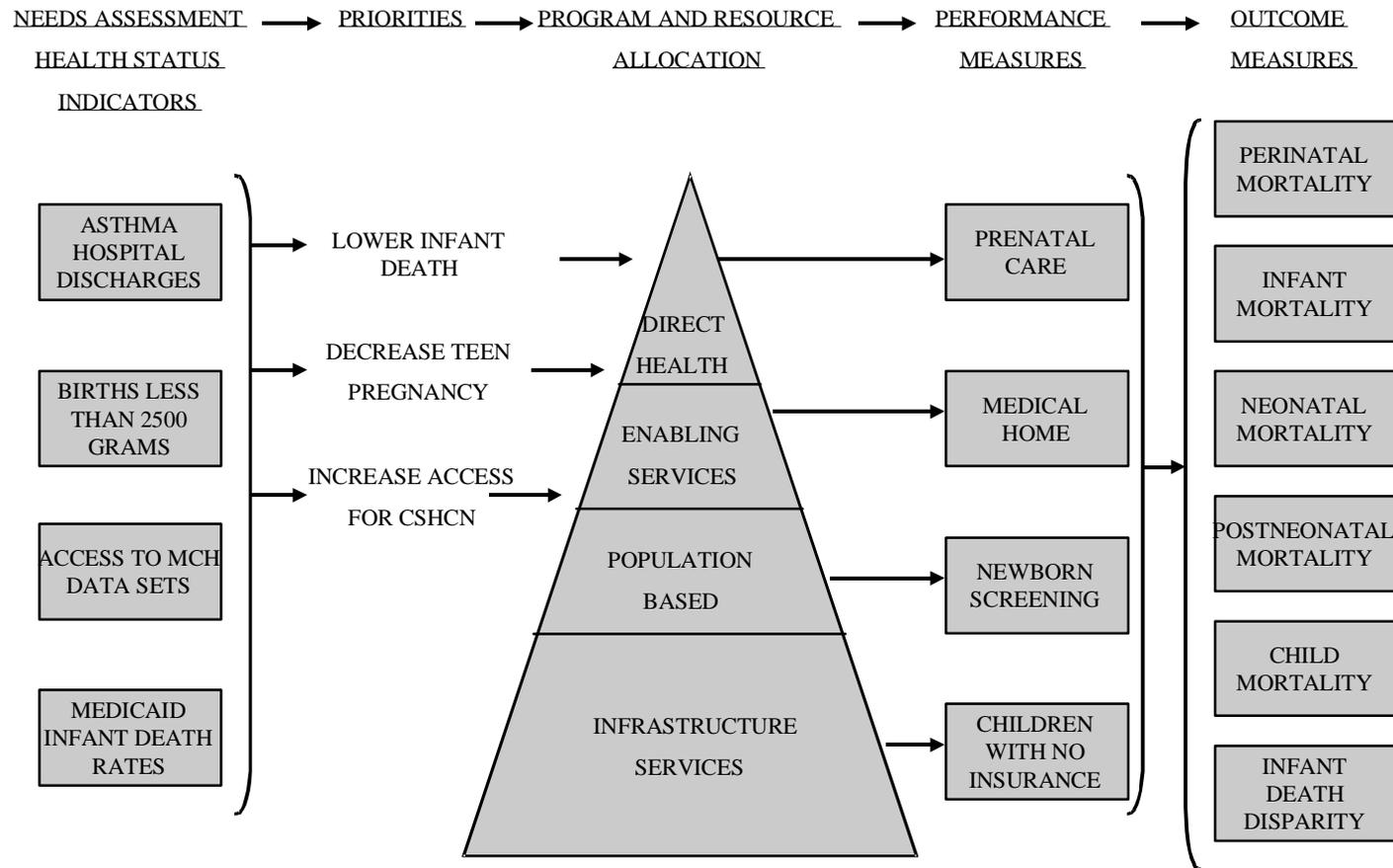
3.4.2.1 Development of State Performance Measures

The ten state performance measures were chosen through a committee and survey process in late 1997 and early 1998. Figure 4 contains Colorado’s list, shown after the core performance measures. A new measure (State Performance Measure 11) has been written for FY 01, which replaces State Performance Measure 9. The new measure broadens the scope of Measure 9 to include efforts by the state to provide data at the local level.

A wording change has been made this year to State Performance Measure 7, adding the phrase, “research-based health education” to the measure on school-based health. The ten state performance measures are shown after the national “core” performance measures in Figure 4. Detail sheets for each performance measure can be found in Section 5.6.

Figure 3

TITLE V BLOCK GRANT PERFORMANCE MEASUREMENT SYSTEM



3.4.2.2 Discussion of State Performance Measures

A table that summarizes the relationships among the priorities and the national and state performance measures is provided beginning on page 116, following Figure 4. The state performance measures are shown in the right-hand column.

In accordance with instructions from the guidance, each state performance measure is listed below, followed by its relationship to Colorado's priority areas, its level of placement in the pyramid, and its relationship to any outcome measures. A short paragraph follows on the reasons for its choice as a state performance measure.

It should be noted that the placement of each measure in a level of the pyramid is somewhat arbitrary. The state's efforts are for the most part concentrated in the lowest level of the pyramid, known as "infrastructure-building" activities. The Family and Community Health Services Division performs needs assessment, carries out evaluations, plans for the state, develops policy, coordinates programs, assures assessment of quality in programs, develops standards, provides monitoring and training, does limited applied research, and support systems of care and information and data systems. These are all the activities specified at the "bottom" of the pyramid. (See Figure 2 on page 31).

The state does, however, carry out many activities that are shown in the next to the lowest level of the pyramid, under "population-based" services. The activities listed there include newborn screening, lead screening, immunization, Sudden Infant Death Syndrome activities, oral health, unintentional and intentional injury prevention, teen pregnancy prevention, nutrition, and outreach and public education. The performance measures shown below that are population-based are addressed mostly through outreach and public education.

Colorado has one measure marked as "enabling," because some support services are offered in the schools for teenagers who are having problems with alcohol. No state measures are "direct health care," since none of the measures chosen related closely to basic health services.

State Performance Measure 1: The proportion of high school students reporting having drunk alcohol in the past month

Priority Area: Reduce substance abuse (alcohol, tobacco, and drugs)

Pyramid Level: Enabling Services

Related Outcome Measures: Infant mortality rate, neonatal mortality rate, child death rate, low birth weight rate

Alcohol use is pervasive among Colorado's teens, and the year 2000 objective of 40 percent using alcohol in the last month is substantially below the 53 percent level found in the 1995 Youth Risk Behavior Study. One of Colorado's priority areas is the reduction of substance abuse. There are no national performance measures related to this priority area. Therefore, reduction of alcohol

use among teens was selected as a measure of reducing substance abuse. This state performance measure was a state objective since 1995, and was retained as a performance measure in 1998.

State Performance Measure 2: The proportion of all pregnancies that are unintended

Priority Area: Reduce teen pregnancy and unintended pregnancy in women of all ages

Pyramid Level: Population-Based Services

Related Outcome Measures: Infant mortality rate, neonatal mortality rate, postneonatal mortality rate, perinatal mortality rate, child death rate, low birth weight rate

The reduction of teen pregnancy, and of unintended pregnancy among women of all ages, was selected as one of Colorado's priority areas. Only one national performance measure is related: the teen birth rate for ages 15 to 17. The national measure does not address unintended fertility among older women. The state performance measure was selected because half of all pregnancies are estimated to be unintended, and the majority of these are among women who are not teenagers. This state performance measure was a state objective since 1995, and was retained as a state performance measure in 1998.

State Performance Measure 3: The incidence of maltreatment of children younger than 18 (including physical abuse, sexual abuse, emotional abuse, and/or neglect)

Priority Area: Reduce child and adolescent morbidity; improve efforts to reduce unintentional and intentional injury

Pyramid Level: Population-Based Services

Related Outcome Measures: Infant mortality rate, postneonatal mortality rate, child death rate.

Reducing child and adolescent morbidity is an important priority area for Colorado, as are improving efforts to reduce unintentional and intentional injury. This state performance measure has been an objective since 1995, and was retained in 1998 because the national performance measures related to the two priority areas were limited to infants, motor vehicle fatalities, and suicides. This state measure will document progress in the reduction of child abuse.

State Performance Measure 4: The proportion of child care settings with access to comprehensive health and safety consultation and training

Priority Area: Increase health and safety in child care settings

Pyramid Level: Population-Based Services

Related Outcome Measures: Child death rate

Colorado is acknowledged to be a national leader in addressing the needs of all parents regarding comprehensive child care. This state performance measure addresses the health and safety in child care settings priority. Since there are no national performance measures for this priority, it was clear that Colorado needed a specific measure. As a starting point for health and safety in child care settings, it is necessary for every provider to have a professional source for accurate information and consultation about child health and safety.

State Performance Measure 5: The rate of deaths to adolescents age 15-19 caused by motor vehicle crashes per 100,000 children

Priority Area: Reduce child and adolescent morbidity; improve efforts to reduce unintentional and intentional injury

Pyramid Level: Population-Based Services

Related Outcome Measures: None

Reducing unintentional injury, and reducing morbidity due to accidents, are two priorities for Colorado's maternal and child health program. A national performance measure is available for the younger population. It made sense to have a corresponding performance measure for the older teens, since motor vehicle fatality rates are higher among older teens than among younger. In addition, this has been a state objective since 1991, and was retained as a state performance measure in 1998.

State Performance Measure 6: The proportion of high school students reporting regular use of tobacco products

Priority Area: Reduce substance abuse (alcohol, tobacco, and drugs)

Pyramid Level: Population-Based Services

Related Outcome Measures: Infant mortality rate, low birth weight rate

Tobacco use is prevalent among Colorado's teens, and it is well-substantiated that tobacco use plays a major role in causing health problems in later life. Furthermore, women who smoke and become pregnant are more likely to have low birth weight infants, and those infants are at increased risk of mortality. There are no national performance measures related to Colorado's priority area to reduce substance abuse. Therefore, reduction of tobacco use among teens was selected as a state performance measure. This measure was a state objective since 1995 and was retained as a state performance measure in 1998.

State Performance Measure 7: The proportion of children and adolescents attending public schools who have access to research-based health education and basic preventive and primary, physical, and behavioral health services through school-based health centers

Priority Areas: Reduce teen pregnancy; reduce child and adolescent morbidity and mortality; improve efforts to reduce unintentional and intentional injury; increase access to health care (including behavioral health care); reduce substance abuse (alcohol, tobacco, and drugs)

Pyramid Level: Infrastructure-Building

Related Outcome Measures: Infant mortality rate, postneonatal mortality rate, child death rate

Colorado has been a leader in the nation in implementing the concept of school-based health centers. Accessibility of health services is a critical maternal and child health issue, particularly for adolescents, and school-based health centers integrate mental health and primary care services in an educational setting. This approach assures that low-income, high-risk student populations receive the health services they need on a timely basis, removed from barriers of stigma, cost, transportation, and confidentiality. Colorado embraces the delivery of health services in schools as a key approach to addressing a broad range of health problems among children and teens. Through consultation, technical assistance, and funding, the Colorado Department of Public

Health & Environment encourages communities to plan and implement a scope of services that meet local child health needs, in accordance with community values and resources.

State Performance Measure 8: Percent of Medicaid-eligible children who receive dental services as part of their comprehensive services

Priority Area: Improve oral health and access to oral health care

Pyramid Level: Infrastructure-Building

Related Outcome Measures: None

This measure was selected in Colorado because low-income children have high rates of dental disease. Nationally, it is estimated that 25 percent of children have 75 percent of all the dental decay in children. These youth come from indigent families, who have the fewest financial resources to address their dental needs. These families also have limited access to participating providers.

One of Colorado's ten priorities for maternal and child health is to "improve oral health and access to oral health care." By using this performance measure, we will be able to track improvements in access which should result in improved oral health status.

State Performance Measure 9: The percentage complete of an integrated data system for maternal and child health programs (to improve ability to monitor and assess health needs of women and children), beginning with the Health Care Program for Children with Special Needs

Priority Area: Improve state and local infrastructure by increasing capacity to analyze data

Pyramid Level: Infrastructure-Building

Related Outcome Measures: None

In the mid-1990's, we acknowledged that the Health Care Program for Children with Special Needs registration and data system had been inadequate for many years. In 1994, the Project for Capacity Assessment and Needs Determination for OBRA '89 (CAN-DO) identified updating this system as urgent. Development began late in FY 97 on a new Windows-based system for HCP called IRIS (Integrated Registration and Information System. The first module serves the HCP program, and includes many new features such as ticklers and notes for care coordination, reports for needs assessments and management analysis, and letters to families and providers. IRIS provides data to be used in estimating National Performance Measures 1 (SSI beneficiaries), 3 ("medical/health home"), and 11 (source of insurance).

Half the project was completed by the end of FY 99. Other modules for child health and family planning are scheduled to be completed during FY 00. Information about the population served through Title V funds and the types of services provided will be extremely important to efforts in needs assessments, planning, evaluation, monitoring, quality assurance and coordination.

This measure will be replaced by State Performance Measure 11 in FY 01. The IRIS project will continue, but it will no longer be a state performance measure.

State Performance Measure 10: The rate of homicides among teens 15-19 and among black male teens.

Priority Area: Improve efforts to reduce unintentional and intentional injury

Pyramid Level: Infrastructure-building

Related Outcome Measures: None

Homicide rates provide the most basic measure of the amount of violence in a society, and the United States is recognized internationally as a country with very high rates of homicide. Colorado's statistics bear out this fact, and our rates for teens in particular exceed the Healthy People 2000 goal of 7.2 deaths per 100,000 (all ages). In addition, our rates for black male teens are far higher than for all teens.

Changing our culture of violence is a long-term goal for Colorado's public health programs. The 1999 Columbine school shooting, with 14 homicides and two suicides, is cited daily as evidence of the need for the reduction in violence in our state.

Note: State Performance Measure 11 replaces State Performance Measure 9 beginning in FY 01.

State Performance Measure 11: The degree to which the State supports data analysis and dissemination of results for local and state MCH planning.

Priority Area: Improve state and local infrastructure by increasing capacity to analyze data, carry out evaluations, develop quality standards, and assure availability of services

Pyramid Level: Infrastructure-building

Related Outcome Measures: Support of data systems and analysis is necessary to determine the levels of outcome measures; all are impacted by this effort.

The Advisory Council on Health Programs for Women and Children decided in the spring of 2000 that the state's efforts to provide data should become a state performance measure. This decision was based on the growth of the CoHID project, the development of the state health department's and the Division's web pages, and the commitment of Division staff to assist local health entities to analyze data for their communities and counties.² State efforts to provide data are critical to the ability of local agencies to define and prioritize their needs. Efforts to support data analysis and utilization must be continued to maximize local and state planning.

² The increase in use of the Family and Community Health Services Division web pages is documented in just the past year: from 325 hits in June 1999 to 2,594 hits in April 2000.

FIGURE 4
PERFORMANCE MEASURES SUMMARY SHEET

Core Performance Measures	Pyramid Level of Service				Type of Service		
	DHC	ES	PBS	IB	C	P	RF
1) The percent of State SSI beneficiaries less than 16 years old receiving rehabilitative services from the State Children with Special Health Care Needs Program.	X				X		
2) The degree to which the State Children with Special Health Care Needs Program provides or pays for specialty and subspecialty services, including care coordination, not otherwise accessible or affordable to its clients.	X				X		
3) The percent of Children with Special Health Care Needs in the State who have a “medical/health home.”		X			X		
4) Percent of newborns in the State with at least one screening for each of PKU, hypothyroidism, galactosemia, hemoglobinopathies.			X				X
5) Percent of children through age 2 who have completed immunizations for Measles, Mumps, Rubella, Polio, Diphtheria, Tetanus, Pertussis, Haem. Influenza, Hep.B.			X				X
6) The birth rate (per 1,000) for teenagers aged 15-17.			X				X
7) Percent of third grade children who have received protective sealants on at least one permanent molar tooth.			X				X
8) The rate of deaths to children aged 1-14 caused by motor vehicle crashes per 100,000 children.			X				X
9) Percentage of mothers who breastfeed their infants at hospital discharge.			X				X
10) Percentage of newborns who have been screened for hearing impairment before hospital discharge.			X				X
11) Percent of Children with Special Health Care Needs (CSHCN) in the State CSHCN Program with a source of insurance for primary and specialty care.				X	X		
12) Percent of children without health insurance.				X	X		
13) Percent of potentially Medicaid eligible children who have received a service paid by the Medicaid Program.				X		X	
14) The degree to which the State assures family particip. in program and policy activities in the State Program.				X		X	
15) Percent of very low birth weight live births.				X			X

Core Performance Measures	Pyramid Level of Service				Type of Service		
	DHC	ES	PBS	IB	C	P	RF
16) The rate (per 100,000) of suicide among youths 15-19.				X			X
17) Percent of very low birth weight infants delivered at facilities for high-risk deliveries and neonates.				X			X
18) Percent of infants born to pregnant women receiving prenatal care beginning in the first trimester.				X			X

Negotiated Performance Measures	Pyramid Level of Service				Type of Service		
	DHC	ES	PBS	IB	C	P	RF
1) The proportion of high school students reporting having drunk alcohol in the past month.		X					X
2) The proportion of all pregnancies that are unintended.			X		X		
3) The incidence of maltreatment of children younger than 18 (including physical abuse, sexual abuse, emotional abuse, and/or neglect).			X		X		
4) The proportion of child care settings with access to compreh. health and safety consultation and training.			X			X	
5) The rate of deaths to adolescents age 15-19 caused by motor vehicle crashes per 100,000 children.			X				X
6) The proportion of high school students reporting regular use of tobacco products.			X				X
7) The proportion of children... who have access to... services thru school-based health centers				X	X		
8) The percent of Medicaid-eligible children who receive dental services as part of their comprehensive services.				X	X		
9) The percentage complete of an integrated data system for MCH programs, beginning with HCP. (ends with FY 00)				X		X	
10) The rate of homicides among teens 15-19 and among black male teens.				X		X	
11) The degree to which the State supports data analysis and dissemination of results for local and state MCH planning. (SPM 11) (begins with FY 01)				X		X	

NOTE: DHC = Direct Health Care ES = Enabling Services PBS = Population Based Services
 IB = Infrastructure Building C = Capacity P = Process RF = Risk Factor

Top Ten Priorities for Colorado, National Performance Measures, and State Performance Measures for the MCH Block Grant Application for FY 00

Priorities (Chosen by Colorado)	18 National Performance Measures (Determined by MCH Bureau)	10 Additional State Performance Measures and One Outcome Measure (Chosen by Colorado)
Reduce teen pregnancy and unintended pregnancy in women of all ages	- The rate of birth (per 1,000) for teenagers aged 15-17 years (NPM 6)	- The proportion of children ...w/access to... services thru school-based health centers (SPM 7); see below* - The proportion of all pregnancies that are unintended.(SPM 2)
Improve perinatal outcomes	- Percent of infants born to pregnant women receiving prenatal care beginning in the first trim. (NPM 18) - Percentage of mothers who breastfeed their infants at hosp. discharge (NPM 9) - Percent of very low birth wt. live births (NPM 15) - Percent of very low birth wt. infants delivered at facilities for high-risk deliveries and neonates (NPM 17)	- The low birth wt. rate (Outcome Measure)
Reduce child and adolescent morbidity	- Percent of infants born to pregnant women receiving prenatal care beginning in the first trim. (NPM 18) - Percent of newborns in the state with at least one screening for each of PKU, hypothyroidism, galactosemia, hemoglobinopathies (combined) (NPM 4) - Percentage of newborns who have been screened for hearing impairment before hosp. discharge (NPM 10) - Percentage of mothers who breastfeed their infants at hosp. discharge (NPM 9) - The rate of deaths to children aged 1-14 caused by MV crashes per 100,000 children (NPM 8)	- The low birth wt. rate (Outcome Measure) - The incidence of maltreatment of children younger than 18 (incl. physical abuse, sexual abuse, emotional abuse, and/or neglect). (SPM 3) - * The proportion of children and adolescents attending public schools who have access to research-based health education and to basic preventive and primary, physical, and behavioral health services through school-based health centers (SPM 7) - The rate of deaths to adolescents age 15-19 caused by MV crashes per 100,000 children (SPM 5)
Increase health and safety in child care settings	[None]	- The proportion of child care settings with access to comprehensive health and safety consultation and training. (SPM 4)
Improve efforts to reduce unintentional and intentional injury, addressing MV crashes, suicide, child abuse and other violence	- The rate (per 100,000) of suicide deaths among youths age 15-19 (NPM 16) - The rate of deaths to children aged 1-14 caused by MV crashes per 100,000 children (NPM 8)	- The proportion of children .. w/ access to ... services thru school-based health centers (SPM 7); see * - The rate of deaths to adolescents age 15-19 caused by MV crashes per 100,000 children. (SPM 5) - The incidence of maltreatment of children younger than 18 (incl. physical abuse, sexual abuse, emotional abuse, and/or neglect). (SPM 3) - The rate of homicides among teens 15-19 and among

		black male teens. (SPM 10)
Improve immunization rates for all children	- Percent of children through age 2 who have completed immunizations for measles, mumps, rubella, polio, diphtheria, tetanus, pertussis, hemophilus influenza, and hepatitis B(NPM 5)	See National Performance Measure
Increase access to health care (including behavioral health care)	- Percent of all children in the state w/o health insurance (NPM 12) - Percent of potentially Medicaid-eligible children who have received a service paid for by the Medicaid Program (NPM 13) - Percent of children with special health care needs in the state who have a "medical/health home" (NPM 3) - The degree to which the State CSHCN Program provides or pays for spec. and subspec. services, incl. care coordination, not otherwise accessible or affordable to its clients (Nine-point scale) (NPM 2) - Percent of children with special health care needs in the state CSHCN Program with a source of insurance for prim. and spec. care (NPM 11) - The percent of state SSI beneficiaries less than 16 years old receiving rehab. services from the state CSHCN Program (NPM 1)	- * full text,: The proportion of children and adolescents attending public schools who have access to research-based health education and to basic preventive and primary, physical and behavioral health services through school-based health centers (SPM 7)
Improve state and local infrastructure by increasing capacity to analyze data, carry out evaluations, develop quality standards, and assure availability of services to all women and children, incl. children with SHCN	- The degree to which the state assures family participation in program and policy activities in the state CSHCN program (NPM 14)	-The percentage complete of an integrated data system for maternal and child health programs (to improve ability to monitor and assess health needs of women and children), beginning with the Children with Special Health Care Needs Program (SPM 9). Ends with FY 00. -The degree to which the State supports data analysis and dissemination of results for local and state MCH planning. (SPM 11). Begins with FY 01.
Reduce substance abuse (alcohol, tobacco, and drugs)	[None]	- The proportion of children and adolescents attending public schools who have access to basic preventive and primary, physical and behavioral health services through school-based health centers (SPM 7) - The proportion of high school students reporting regular use of tobacco products.(SPM 6) - The proportion of high school students reporting having drunk alcohol in the past month. (SPM 1)
Improve oral health and access to oral health care	- Percent of third grade children who have received protective sealants on at least one permanent molar tooth (NPM 7)	- Percent of Medicaid-eligible children who receive dental services as part of their comprehensive services. (SPM 8)

3.4.2.3 Five Year Performance Targets

Targets have been set through FY 03. The targets are placed on the top line of each measure listed on Form 11, which is found in Section 5.4. In many cases, targets for FY 01, FY 02, and F03 are the same. It is difficult to project what level the targets should be for many measures so far into the future. We anticipate improving our forecasting ability as we gain more experience over time with these measures.

3.4.2.4 Review of State Performance Measures

The maternal and child health staff at the Colorado Department of Public Health & Environment look forward to discussing the change in the information and data measure with the federal review panel in Denver in August 2000.

3.4.3 Outcome Measures

Details of the six national outcome measures and the one Colorado outcome measure are contained in Form 12. Targets have been set for future years including for FY 03 (calendar 2002). Baseline information is provided for calendar years 1995 through 1998.

We anticipate maintaining our infant mortality rate at or below 6.7 deaths per 1,000 births by 1999. We are working to reduce the ratio of black infant mortality to white infant mortality from 2.3 in 1996 to 2.2 by the year 2000 and 2.1 in 2001 through 2003.

We plan to keep the neonatal mortality target rate at or below 4.5 deaths per 1,000 births by 1999. Similarly, we anticipate a postneonatal mortality rate of 2.2 in the coming years, and an unchanged perinatal mortality rate of 11.0.

It is anticipated that the 1999 statewide Premature Birth Prevention Project promoted by the Colorado Ob-Gyn Society, in conjunction with the Colorado Department of Public Health & Environment, Newborn Hope, the March of Dimes, the Colorado Chapter of the American College of Nurse Midwives, the Colorado Academy of Family Physicians, and the Colorado Insurance Physicians Insurance Corporation (COPIC) Foundation, will contribute to positive birth outcomes in the coming years. The Colorado Premature Birth Prevention Project was begun in January 1999. Physicians from the Colorado Ob-Gyn Society visited the 58 hospitals that deliver babies to discuss with providers the prematurity and low birth weight rates in their communities, the reasons behind the rates, and prevention strategies. In addition to provider education, the project included the distribution of a patient education booklet about preterm birth to every pregnant woman in the state during 1999 (bilingual English/Spanish). The project also included a media campaign focusing on the importance of early prenatal care, avoidance of substance use during pregnancy, and signs and symptoms of preterm labor; and a website with information

about preterm birth prevention for consumers and health care providers.

At this time, we do not anticipate further reductions in mortality rates beyond those shown in the next few years in Form 12. With the high incidence of multiple gestations, and increasing low and very low birth weight rates in recent years, we believe that maintaining recent levels will be challenging.

The target for the low birth weight rate in 2000 was reset to 8.6 percent for that year and 2001, and to 8.5 percent in 2002 and 2003. (A rate of 7.0 percent had been set a number of years ago for the year 2000). It is difficult to project into the future the impact of the efforts to reduce low birth weight by increasing the proportion of women who gain weight adequately during pregnancy and who do not smoke. Efforts to reduce premature rupture of membranes through treating bacterial vaginosis are also just beginning. We plan to adjust goals in future years as we analyze birth certificate data on an ongoing basis and calculate the impact on the low birth weight rate of the strategies proposed in *Tipping the Scales: Weighing in on Solutions to the Low Birth Weight Problem in Colorado*. In fact, if there should be rapid changes in assisted reproductive technologies to reduce the number of high-order multiple births, there is additional hope that we can improve mortality rates for infants and neonates.

We have targeted a decrease in the child death rate, from the 1996 level of 23.1 deaths per 100,000 children age 1 through 14, to 22.0 in the years 2000 through 2003. This rate is partially dependent on improvements in motor vehicle safety and enforcement (see the Motor Vehicle Fatalities Brief in Section 5.3, Other Supporting Documents).

REQUIREMENTS FOR THE ANNUAL PLAN

4.1 Program Activities Related to Performance Measures

This section contains the plans for FY 01 for addressing each of the eighteen national performance measures and the ten additional state performance measures. The target for each measure is cited, and the activities that will be undertaken are described. Referring to Form 11 may help the reader follow the changes between the years. Because the performance measures are still relatively new, however, some of them require baseline data before future targets can be set.

Direct Services: Pregnant Women, Mothers and Infants

There are no national performance measures under this heading. Colorado's state performance measures do not include any that measure direct service.

Direct Services: Children

There are no national or state performance measures under this heading.

Direct Services: Children with Special Health Care Needs

National Performance Measure 1

The percent of state SSI beneficiaries less than 16 years old receiving rehabilitative services from the state CSHCN Program

The target for FY 01 for this measure is set at 10 percent, slightly above the level currently determined by the IRIS system (considered to be an undercount). Current information suggests that additional services from the Title V agencies are not necessary. Should future assessment demonstrate a need not currently apparent, we will revise our target.

National Performance Measure 2

The degree to which the state Children with Special Health Care Needs (CSHCN) Program provides or pays for specialty and subspecialty services, including care coordination, not otherwise accessible or affordable to its clients

The Health Care Program for Children with Special Needs currently covers all nine of the services in this measure, and we expect this to be the case in FY 01. The Child Health Plan Plus includes many services previously paid for with Title V funds by HCP. However, because CHP+ has maximum benefit caps on therapies, expendable and durable medical equipment, nutrition counseling and hearing aids, HCP continues to provide payment for those services when the caps have been reached. In addition, HCP is providing Care Coordination Services for many CHP+ and Medicaid-enrolled children.

Enabling Services: Pregnant Women, Mothers and Infants

There are no national or state performance measures under this heading.

Enabling Services: Children

State Performance Measure 1

The proportion of high school students reporting having drunk alcohol in the past month

The proportion of high school students reporting having drunk alcohol in the past month
The target for FY 01 remains at 40 percent. However, the Youth Risk Behavior Survey revealed levels above 50 percent in 1995 (weighted data) and 1997 (unweighted data), and as high as 59 percent in 1999 (unweighted data).

Maternal and Child Health Block Grant dollars will be used in FY 01 to fund the third year of School and Community Partnerships for Adolescent Health Promotion grants in four communities. These include Longmont in Boulder County, Lakewood in Jefferson County, broader Jefferson County, and Basalt, serving youth from Eagle, Garfield, and Pitkin Counties. These programs, incorporating a variety of adolescent risk reduction and youth development strategies, are designed to address Colorado's adolescent performance measures including reduction of alcohol, tobacco, and other substance use; teen fertility; motor vehicle fatalities; and suicide.

The Family and Community Health Services Division required the use of multi-faceted strategies in FY 99 with community agencies that were targeting interrelated adolescent risk behaviors. Communities that sought maternal and child health block grant funding were required to work collaboratively; with a minimum of one local health entity, one local school district, and one local youth-serving agency working together. We anticipate the success of these requirements and strategies in future years in addressing all adolescent performance measures, including alcohol use.

The Child, Adolescent, and School Health Section within the Family and Community Health Services Division has been involved in a two-year Assets for Colorado Youth Statewide Partnership grant. This grant has allowed us to provide information, training and technical assistance to public health agencies, schools, and other local partners in building "developmental assets" and protective factors among youth. Research shows that youth with a greater number of "assets" and/or protective factors are less likely to abuse alcohol and other drugs, as well as less likely to be involved in violence and sexual activity. The Youth Partnership for Health, comprised of 23 young people from around the state who advise the Department of Health and the Department of Human Services on programs and policies for youth, is an example of a group that will help us identify and implement strategies that youth perceive as being effective.

In addition, in FY 01, state health department staff will continue to work closely with staff and programs in other state agencies to identify common benchmarks for risk reduction and building of protective factors/assets and to work together to support and implement local programs. Legislation passed in May 2000 created a Division of Prevention and Intervention Services for Children and Youth within the state health department which will bring together youth prevention and intervention programs from across numerous state agencies. The Child, Adolescent, and School Health Section staff, along with the MCH Director, are actively involved in exploring options and defining the most efficient and effective structure and processes for integration of prevention programs. The goals are to improve outcomes for youth and to simplify the processes for local communities in applying for funds to address youth issues.

As local public health agencies complete their community needs assessments and MCH plans, it is anticipated that a number of them will identify this performance measure as a need in their community and develop/implement strategies to address the need.

Enabling Services: Children with Special Health Care Needs

National Performance Measure 3

Percent of children with special health care needs in the state who have a "medical/health home"

The target for FY 01 is set at 18 percent, unchanged from the level estimated for FY 99. A number of assumptions were made about both the numerator (those special needs children with a medical home) and the denominator (all children with special needs). These estimates must suffice until we obtain results from the national SLAITS (State and Local Area Integrated Telephone Survey) which should provide statistically reliable estimates of the numerator and denominator. Unfortunately, Colorado estimates may not be available until 2002, but their determination will mark the first time Colorado data are available to answer such questions.

With the development and implementation of the IRIS system we were able for FY 99 to count the number of children registered with HCP who have medical homes. However, this calculation provides only part of the information that the performance measure seeks.

Population-Based Services: Pregnant Women, Mothers and Infants

National Performance Measure 4

Percent of newborns in the state with at least one screening for each of PKU, hypothyroidism, galactosemia, hemoglobinopathies

Colorado's current system of newborn screening and tracking provides evidence of an estimated 97.4 percent of all births being appropriately screened. A system of linking the

Electronic Birth Certificate to the newborn screening specimen specifically, however, is not yet in place, although its development has been underway for some time. By the end of FY 01 we may be able to provide an accurate measure of the proportion of newborns who have received screening tests during that fiscal year. Linking the screening test to the birth certificate through the Electronic Birth Certificate system has proved problematic, since only about 20 percent of birth certificates are received by the Colorado Department of Public Health & Environment prior to the newborn screening testing. Until the EBC system is faster, tracking the tests by using the birth certificate is not yielding enough data.

New software which provides the testing-birth certificate linkage is gradually being installed at hospitals around the state. It is anticipated that eventually the linkage and the improved speed of the EBC system will provide the data needed to accurately measure this indicator. At the time this becomes the case, targets will be set for FY 01.

It should be noted that the linking system is only applicable to the births that are registered through the Electronic Birth Certificate (EBC) system. Currently, about 92 percent of all Colorado births are registered in this way. The hospitals which do not participate are typically small rural hospitals that are not planning to utilize the EBC system. It is possible that the proportion of births registered and followed through the EBC will not increase greatly above 92 percent. Therefore, the linking system to newborn screening will not be able to reflect all the births in the state. Estimates of newborn screening will continue to be made for the remaining 8 percent of births.

During FY 00, screening for Congenital Adrenal Hyperplasia (CAH) was added to the current list. It is anticipated that the laboratory will be ready to implement this change in July of 2000. This disorder occurs with a frequency of roughly 1/10,000 live births compared to an incidence of 1/23,000 for PKU in Colorado.

Within FY 00 we are planning to seek the approval of the state Board of Health for addition of Tandem Mass Spectrometry (TMS) to our newborn screening processes to detect Medium Chain Acyl-CoA Dehydrogenase Deficiency (MCADD) and roughly 30 other Fatty Oxidation Disorders and organic acidemias that are treatable if identified early. MCADD, which is the primary focus of this effort, occurs with an incidence of approximately 1/10,000, but if all the known treatable disorders that TMS can identify are considered, the incidence figure is roughly 1/4,000. This makes the addition of screening for these disorders potentially very cost effective and allows the possibility of preventing a great deal of morbidity and mortality.

National Performance Measure 5

Percent of children through age 2 who have completed immunizations for measles, mumps, rubella, polio, diphtheria, tetanus, pertussis, hemophilus influenza, and hepatitis B

The FY 01 objective continues to be 90 percent of two-year olds appropriately immunized, the same target that has been in place for a number of years.

In March 1999, the Director of the Colorado Department of Public Health & Environment established a departmental Immunization Initiative. Recognizing that improvements in Colorado's immunization rate required the energies of all the divisions in the department, the Director appointed a steering committee that meets every other month to give direction to immunization activities. Merrill Stern, Dr. Bill Letson, Karen O'Brien, Patricia Daniluk, and Courtney Thomas are five representatives from the Family and Community Health Services Division who are members of the steering committee. Work groups have also been established, including Communications and Marketing, Tracking System, and Legislative/External Coordination.

The Colorado Legislature did not approve funding for the Tracking System in its 1999 session or in its 2000 session. While the Program is unsure whether it will continue to pursue legislative funding for a tracking system, it does plan to work with the state Medicaid Agency to obtain federal Medicaid funds for the registry. In addition, the Immunization Program has obtained letters of financial support for a tracking system from all of the managed care organizations in Colorado. The Immunization Program plans to meet with these organizations to further explore the possibility of a statewide tracking system.

Since the administration of the fourth DTaP is the primary reason Colorado has been unable to meet the 90 percent immunization target, the Department is emphasizing the following strategies in the next year:

- Ⓒ Encouraging the simultaneous administration of all vaccines to 12 to 15-month old children who are due and eligible for them, including the fourth DTaP
- Ⓒ Providing immunizations at every physician or nurse visit, including mild illness visits
- Ⓒ Ensuring that providers follow the accelerated immunization schedule for children who start the series late or who have missed immunizations and are behind schedule
- Ⓒ Implementing an active recall system for children who fail their 12-15 month well child visit or immunization appointments.

In April 1999, the Colorado Board of Health approved changes in immunization school entry requirements (effective 7/1/2000). Among a number of changes that are consistent with the Advisory Committee on Immunization Practices and the American Academy of Pediatrics recommendations, the fourth DTaP is required by 18 months rather than by 4 to 6 years of age, and the second MMR is required at ages 4 to 6 rather than at ages 11 to 12. These

changes should have a positive impact on Colorado's overall immunization rate in the next few years.

National Performance Measure 9

The percent of mothers who breastfeed their infants at hospital discharge

Colorado's breastfeeding rates far exceed the national goal of 75 percent of women initiating breastfeeding. According to Colorado PRAMS data, 82 percent of Colorado mothers initiated breastfeeding in 1998. The target rate of 85 percent, first set in 1998, is retained as Colorado's objective for FY 01. At the current rate of annual increase the goal of 85 percent appears attainable.

Nationally, WIC participants have a much lower rate of initiation as compared to women who do not participate in WIC; however, in Colorado WIC participants had only a slightly lower rate of initiation (76 percent vs. 85 percent among non-WIC patients³). Higher breastfeeding rates among WIC participants, meeting the national if not the state target, can be attributed to the collaborative efforts among the Colorado WIC program, the Colorado Breastfeeding Task Force and other community organizations.

During FY 01, the Colorado Breastfeeding Task Force and the Colorado WIC Program will generate activities statewide to celebrate breastfeeding during WIC National Breastfeeding Week and throughout the year. Activities will target breastfeeding initiation, as well as duration rates. Colorado PRAMS data indicate that a significant number of women cease breastfeeding in the early months postpartum.

Activities for FY 01 will include development of a breastfeeding resource activities packet for the 2001 celebration and media packet and continued production of a quarterly newsletter with distribution to 2000 health care providers. Other activities include offering a professional breastfeeding training; encouraging employers to provide breastfeeding support for working mothers; and continued work in the area of insurance reimbursement for lactation consultation and breastfeeding equipment.

National Performance Measure 10

Percentage of newborns who have been screened for hearing impairment before hospital discharge

The FY 01 target is set at 90 percent, 5 percentage points above the FY 99 target. All of the birthing hospitals in Colorado have access to providing a newborn hearing screen. Six small hospitals, with fewer than 50 births at each hospital per year, are sharing equipment, and have been successful in providing outpatient screens if the equipment is not available during the normal delivery stay. Further efforts to screen home births with accessible screening equipment in local Health Care Program for Children with Special Health Care Needs offices

³ 1998 PRAMS data.

will also increase the percentage of screens.

We would like to increase the percentage screened to 95 percent by FY 02 and to maintain this percentage in FY 03 to meet the standard set forth by the national Joint Committee on Infant Hearing. With the award of an MCH grant on April 1, 2000, Colorado will be able to further refine its entire system, from screening through intervention, by enhancing the data management and tracking system as well as providing a statewide parent support network.

State Performance Measure 2

The proportion of all pregnancies that are unintended

The target level for FY 01 has been set at 48 percent of all pregnancies. A major goal of our Title X Family Planning Program is the reduction of unintended pregnancy. Besides clinical services, the Program also provides community-based efforts to address this critical public health issue. Program activities continue to increase awareness among health care providers and citizens of the impact of unintended pregnancy.

Colorado is developing approaches to increase awareness of unintended pregnancy. Many Coloradans lack adequate knowledge about contraception and reproductive health generally. The Women's Health Section is involved in a six-state social marketing project to reduce unintended pregnancy. The contractor is Best Start and the project was in the initial stages in the spring of 2000.

Reducing the proportion of unintended pregnancy is dependent on many factors, one of which is access to effective contraception. During the fall of 1999 the Women's Health Section worked with the Colorado Department of Health Care Policy and Financing to write a HCFA waiver to seek contraceptive services for low income women. The waiver was submitted in February 2000. The approval process is lengthy, but the expectation is that the waiver will be approved, and that greatly improved access to contraception will begin in the year 2002.

Population-Based Services: Children

National Performance Measure 6

The rate of birth (per 1,000) for teenagers aged 15 through 17 years

The target for FY 01 is 29.5 births per 1,000 teens, slightly below Colorado's actual 1998 age-specific fertility rate of 30.2. Fertility has been dropping for this age group since 1992, but the 1998 rate did not decline, remaining at the same level as the 1997 rate.

According to the 1999 Colorado Youth Risk Behavior Survey, 51 percent (unweighted data) of teens had ever had sexual intercourse, up from 41 percent in 1997 (unweighted data). In addition, of those who had sexual intercourse during the past three months, 55 percent had

used a condom during last sexual intercourse, and 18 percent had used oral contraceptives.

During FY 01 a number of strategies will be used statewide to meet the target rate. Colorado's MCH-funded adolescent programs are increasingly moving from single problem focus to approaches that emphasize positive youth development; building resiliency, protective factors, and development assets; and promoting youth leadership, community service, and youth input into creating solutions. The Colorado Department of Public Health & Environment has a grant from "Assets for Colorado Youth" that enables us to provide technical assistance, training, and resources to local communities in integrating the developmental assets approach into their community programs for adolescents. State Health Department staff also offer semi-annual trainings across the state on "The Culture of Adolescence," which includes strategies for pregnancy prevention and new tools and techniques for interviewing adolescents.

All of the school and community partnerships for adolescent health promotion grantees emphasize positive youth development and reduction of risk behaviors, including unprotected sexual activity. One of the school and community partnerships for adolescent health promotion grantees (funded for three years with MCH dollars) is specifically targeting adolescent males, many of them Latino, for adolescent pregnancy prevention efforts. The grantees also work with teen fathers with the goal of increasing the role of teen fathers in their babies' lives and preventing subsequent pregnancies.

In addition, Colorado's Abstinence Education program will be funding six local community projects which support abstinence-only education. These projects target 10-17 year olds, with an emphasis on 10-14 year olds. Two of the projects specifically target high-risk middle school students. The programs offer a range of approaches, including classroom curricula that focus on promoting abstinence and reducing other risk behaviors, to mentoring and after-school programs that emphasize character education and support for making healthy life choices. The abstinence education program also plans to develop a social marketing campaign promoting abstinence from premarital sexual activity.

Under the new MCH planning process, additional communities may identify teen pregnancy as a problem they want to address, with the potential of developing plans to create new or expand existing teen pregnancy prevention efforts. Local health agencies are being encouraged to explore the possibility of tapping local TANF dollars to maximize the efforts and dollars available to address this issue.

School-based health centers are another vehicle to provide education related to pregnancy prevention (promoting abstinence and/or use of effective contraception) and to identify sexually-active teens, either providing direct reproductive health care services or linking them with resources in the community to access contraceptives. The availability of longer-acting

contraceptives (Depo-Provera and Norplant) and the links with Title X Family Planning providers also appear to be a factor in the declining teen fertility rate.

We anticipate meeting the FY 01 target of 29.5 through a combination of these efforts. The greatest challenge will be to develop approaches that affect the teen fertility rate among Colorado's Hispanic population, since the Hispanic fertility rate for 15-17 year olds is 93/1000. The State Health Department is working with local Hispanic/Latino organizations and other service providers to identify approaches for pregnancy prevention that are effective with this population, with the goal of sharing successful programs and approaches with others.

National Performance Measure 7

Percent of third grade children who have received protective sealants on at least one permanent molar tooth

By the end of FY 01, we anticipate 32 percent of third grade children will have at least one sealant on a permanent tooth. The Chopper Topper Sealant Program is currently at capacity with the number of schools and available volunteer personnel. It is anticipated that the Oral Health Program will provide partial support for another staff hygienist with the program as the lack of volunteers often results in unproductive days.

Discussions will also begin with the Anthem Blue Cross Blue Shield of Colorado Foundation to look at the feasibility of adding a school-based sealant program to the Miles for Smiles Dental Program providing restorative care for non-Medicaid eligible children on the Western Slope. Data is currently being gathered in both the Chopper Topper and Farmworker Health Program to document the number of children who are not receiving sealants because a dentist was not available to screen the child first. In the Chopper Topper Program, the children do not receive sealants if they are not first screened by a dentist. In Farmworker Health, the lack of a dentist is documented, but the child is then screened by a hygienist and appropriate sealants placed. The data will most likely be of value when the State Dental Practice Act sunsets in 2003.

National Performance Measure 8

The rate of deaths to children aged 1-14 caused by motor vehicle crashes per 100,000 children

The target for FY 01 has been set at 3.5 deaths per 100,000 children, a level requiring fewer than 30 deaths per year in the state to this age group. Efforts around car seat and seatbelt use for children will continue statewide. Efforts in the Colorado legislature during the 1998 and 1999 sessions to make seatbelt use a primary law were unsuccessful, and no real effort was made in 2000. Statutes making nonuse of seatbelts a primary offense appear to be one of the most effective methods to increase seatbelt use in a state, and carry the most promise for Colorado to further reduce its rate for children. Acting on its own, the city of Greeley has passed a primary offense law, and it will be instructive to see its impact for Greeley residents.

The Child Fatality Review Committee has a Motor Vehicle Subcommittee which meets regularly. The Committee issued a brief in April 1999 titled, "Motor Vehicle-related Child Fatalities, Colorado 1995-1997." The brief detailed child fatalities by age of driver, showing that 58 percent of all children under age 18 who died in the three-year period were in cars with drivers under the age of 21. The brief is included in the Supporting Documents section of this grant.

Legislation requiring graduated licensing, written to deter unsafe driving among 16-year old drivers, was passed in May 1999 and became effective July 1999. We anticipate a modest decline in child deaths in motor vehicle accidents with the institution and enforcement of this new law. Stronger legislation (e.g., limits on the number of passengers that 16-year-olds can carry) is needed for larger declines to occur.

There is a new effort to provide education to parents and pediatricians around booster seats. Children age 4 to 8 cannot all use safety belts safely without booster seats. No legislation is proposed at this time, but educational efforts are being increased.

Staff are NHTSA certified car seats technicians and provide supervision at car seat checkup events regularly. The general public is learning that many car seats are installed improperly. Design changes required in new cars will help reduce this problem as well.

State Performance Measure 3

The incidence of maltreatment of children younger than 18 (including physical abuse, sexual abuse, emotional abuse, and/or neglect).

The target level for FY 01 continues to be 25.2 per 1,000 children. Colorado's rate has been well below this number in recent years. While it appears that we should lower our target rate to below our current 1998 level (6.6), the widespread belief that this figure is based on underreported events encourages a more cautious approach.

The Child Fatality Review Committee reviews all deaths to children that result from maltreatment. The District Attorney Council is supplied with all medical literature regarding commonly found causes of child deaths due to abuse or neglect, e.g., shaken baby syndrome. During FY 98 and FY 99 over 500 copies of a 140-page manual, *Child Abuse and Neglect: An Introductory Manual for Professionals and Paraprofessionals*, were provided to all local health agencies, the library system in Denver, all school nurses in Colorado, and other public and private offices and agencies upon request. The manual was written by Jane Cotler, Family and Community Health Services Division Child Health Nursing Consultant and Lynn Trefren, Tri-County Health Department Clinic Operations Coordinator for Child Health Services. The wide distribution of this manual, including provision to all child care providers in the state, is part of our health education effort to professionals which should ultimately have

an impact on the level of child abuse in the state.

As an outcome of the distribution of this manual in 1998 and 1999, and as a result of the Colorado Child Care Assessment Survey in 1999, a need was determined for the development of a child abuse and neglect training for child care providers. The training was developed by Jane Cotler, a nurse consultant with the Colorado Department of Public Health & Environment and the co-director of Healthy Child Care Colorado, and Christine Perreault, clinical manager of The Children's Hospital's School Health Program. This training began in June 2000 and can be accessed at <http://www.cdphe.state.co.us/fc/healthychild/healthyhom.asp>.

The *Quick Reference Growth and Development Cards* developed in 1997 by Jane Cotler for child care providers, covering such topics as age-appropriate growth and development, nutrition and feeding, safety and injury prevention, health teachings and family issues, have been translated into Spanish. These cards are being distributed statewide and were recognized as an excellent resource by Dr. Earl Fox in the Health Resources and Services Administration during a 1999 visit to the University of Colorado Health Sciences Center. These cards have proved so effective that they have been widely distributed throughout the country for public and private use, and have been requested internationally as well.

The Colorado Child Care Assessment Survey and the Quick Reference Growth and Development cards can be found at the website shown above.

State Performance Measure 4

The proportion of child care settings with access to comprehensive health and safety consultation and training

A survey conducted during FY 99 found that half (47 percent) of the state's child care settings had regular and consistent access to comprehensive health and safety consultation and training. A goal of 65 percent has been set for FY 02. During the interim, trainings will be available to public health and other nurses to provide continuing education to child care providers throughout the state.

A followup survey will be conducted in FY 02. This date was selected in order to allow for the development of trainings, resources, and community linkage efforts over a three-year period of time since the first survey. This effort, to increase health and safety training accessibility to all child care providers through a system of training local health agency nurses, is expected to result in close to two-thirds of all providers being able to access appropriate consultation regularly.

A newly developed Universal Precautions Training for Child Care Providers (written by Cotler and Perreault) has been selected by the Division of Child Care as its recommended

training for the child care provider target group, and has been designated the reference document for the Colorado Department of Public Health & Environment. This training is available on the Internet at <http://www.cdphe.state.co.us/fc/healthychild/healthyhom.asp>. In addition, this training was distributed to representatives at Region VI and VIII's Tribal HUD Conference Year 2000 Meeting in Denver.

A Child Abuse and Neglect training has also been developed as an additional training module for child care providers, based on child care provider recommendations in the 1999 baseline survey. This is also available on the Healthy Child Care Colorado website cited in the previous paragraph.

With the change of focus in public health practice from direct services to more population-based activities, public health nurses are encouraged to provide child care health and safety consultation services in their communities. An Introduction to Health and Safety in Child Care Nursing Consultation has been presented to nurses and child care providers in forty-six of sixty-three counties in Colorado. A followup Colorado-specific health and safety curriculum based on materials from the University of North Carolina Training Institute will be developed and scheduled for twice-a-year trainings for all nurses who are working with child care center and family providers.

Medication Administration: An Instructional Program for Teaching Unlicensed Personnel to Give Medications to Children Including Infants and Toddlers, is recognized by the Colorado State Board of Nursing and required by the Colorado Department of Human Services Division of Child Care as of July 1, 1999; has been actively presented to child care providers throughout Colorado and has been distributed to all Community Integrated Service System (CISS) grantees.

State Performance Measure 5

The rate of deaths to adolescents age 15-19 caused by motor vehicle crashes per 100,000 children

The target level for FY 01 has been revised downward to 24.0 deaths per 100,000 adolescents, from 25.0 which was attained in 1997 and 1998. Again, as described under the National Performance Measure 8 for children 1 through 14, passage of a seatbelt law which allows stopping a motorist for nonuse is considered to be an effective way to ultimately improve the motor vehicle death rate for this age group as well as for other ages.

Driver inexperience is also considered to be a major factor in fatalities in this age group. According to the Child Fatality Review Committee, such inexperience was present in three-quarters of the crashes that occurred where children under 18 died between 1995 and 1997. Excessive speed is also a factor and was present in 62 percent of the crashes where at least one driver was under the age of 21.

Using information compiled by the Child Fatality Review, graduated licensing legislation was proposed, and subsequently passed by the 1999 Colorado Legislature in May 1999 and implemented in July 1999. The legislation requires a six-month rather than a three-month learning period for drivers under the age of 18 and a log detailing 50 hours' driving with a parent, including 10 hours at night for a minor with an instruction permit. Drivers under age 17 may not drive alone between midnight and 5 a.m. (with some exceptions); all occupants of a car driven by drivers under 17 must be using seat belts or car seats; there may not be more than one passenger in the front seat, and there may be no more passengers in the back seat than there are seat belts. A system of points is assessed against the driver's license for infractions.

We anticipate that these new requirements will have an impact, particularly on new drivers who are disproportionately represented in motor vehicle fatalities. We are hopeful that the changes will have an immediate though modest impact on the number of motor vehicle fatalities, beginning with the year 2000, and that fatalities will decrease in the years ahead. We have set as targets 23.0 as the level in FY 02 and 22.0 as the level in FY 03.

Driver training was dropped in the mid-1980s in most schools in Colorado. Mandatory driver training, with behind the wheel experience, is considered by the Child Fatality Review Committee to be one of the best ways to create good drivers. There is no legislation proposed at this time for reinstatement of driver training, but this strategy remains as one of the more effective options for future declines in the motor vehicle death rate.

State Performance Measure 6

The proportion of high school students reporting regular use of tobacco products

The FY 01 target is set at no more than 11.0 percent of high school students smoking at least one cigarette in the last month. The 1999 Youth Risk Behavior Survey found a 34 percent level (unweighted). Reducing the current level by two-thirds is unlikely in the next year, even when the strategies shown in the discussion under State Performance Measure 1 are employed. However, the reduction of tobacco use among teens is a high priority.

The 2000 state Legislature passed a tobacco settlement bill that gives the state health department about \$15 million dollars to put into tobacco prevention programs. Child, Adolescent, and School Health (CASH) staff will continue to be actively involved with the Colorado Department of Public Health & Environment State Tobacco Education & Prevention Partnership (STEPP) to define how those dollars can be used most effectively. The STEPP program will use the Youth Partnership for Health, created by the CASH Section, to define future directions for youth-driven tobacco prevention efforts. The Youth Partnership gave input into an application for an American Legacy Foundation Tobacco Prevention grant that Colorado anticipates receiving in the summer of 2000. The youth will

provide leadership for the planning and implementation of this grant. These youth have applied to receive national training in youth tobacco prevention and have agreed to provide leadership for a Colorado Youth Tobacco Prevention Summit.

With the influx of the Tobacco Settlement dollars, we anticipate that fewer teens will begin smoking and that the overall percentage will decline in future years, based on evidence from other states that received tobacco settlement dollars sooner.

Two of the four MCH-funded School and Community Partnership for Adolescent Health Promotion grantees will be focusing heavily on tobacco prevention and cessation in the upcoming year. Based on assessment of needs within targeted schools, a new tobacco cessation program will be added at the Jefferson County Open School. In addition, teaching teens about social marketing and tobacco, including how the tobacco companies have marketed their products to teens, is an effective strategy being implemented by the grantees.

Population-Based Services: Children with Special Health Care Needs

There are no national or state performance measures under this heading.

Infrastructure Building Services: Pregnant Women, Mothers and Infants

National Performance Measure 15

Percent of very low birth weight live births

The target set for FY 01 is set at 1.2 percent. Data for the state for 1996 through 1998 shows this percentage to be 1.3 percent.

The work of the Premature Birth Prevention Task Force in 1999 may begin to have an impact in calendar 2000, which is the reporting year for births for FY 01. A joint effort of the Colorado Ob-Gyn Society, the March of Dimes, and the Colorado Department of Public Health & Environment, this group began an effort in the spring of 1999 to educate communities about premature birth and to educate providers about possible prevention methods. Emphasis on screening for bacterial vaginosis, especially among black women, should lead to reductions in early preterm birth as women are identified and treated.

The low birth weight report, *Tipping the Scales: Weighing in on Solutions to the Low Birth Weight Problem in Colorado*, contains recommendations about the risks of multiple gestation inherent in assisted reproductive technology. As fertility specialists improve their methods in future years, multiple births should decline and the incidence of very low birth weight should decline as well. The report also contains information about treating bacterial vaginosis early in pregnancy so as to avoid premature rupture of membranes. As this report is disseminated and its recommendations adopted, we anticipate that the very low birth weight rate can be

reduced.

National Performance Measure 17

Percent of very low birth weight infants delivered at facilities for high-risk deliveries and neonates

The FY 01 target for very low birth weight infants (VLBW) delivered at Level III hospitals is set at 75.0 percent, a large increase over the 60.8 percent found in calendar 1998. This change is made possible by the anticipated addition of Memorial Hospital in Colorado Springs to the group of Level III hospitals in 2000. Memorial serves El Paso and Pueblo counties to the south of Denver. The Colorado Perinatal Care Council has been working with Memorial to ensure that a formal designation is made as soon as possible.

National Performance Measure 18

Percent of infants born to pregnant women receiving prenatal care beginning in the first trimester

The target set for FY 01 (calendar 2000) is 83 percent, the same as the FY 00 target (calendar 1999). The proportion of pregnant women receiving prenatal care in the first trimester increased through calendar 1997 to 82.9 percent, but fell slightly in 1998 to 82.2. Attaining a level of 83 percent in 1999 (last year) and in 2000 (the current year) is possible, but may not occur, given the continuing large increases in Hispanic births. Prenatal care for undocumented women has not been covered under Medicaid. The Health Status section in the Needs Assessment of this application shows an apparent decline in first trimester care for Hispanic women from 1997 to 1998, dropping from 69.6 to 68.2 percent. The 2000 State Legislature passed HB 1076 in May, allowing routine coverage through Medicaid of prenatal care for the first time for women who are undocumented immigrants, starting in July 2000.

We anticipate that calendar 2001 (FY 02) will be the first full year that undocumented women will be more likely to obtain early prenatal care coverage. An estimated 6 percent of all births may be attributable to undocumented women whose late care is now exerting a dampening effect on the total state rate. At first, the legislation may impact only women who are able to obtain care through a managed care organization, but in the future we anticipate expansion of coverage.

If Hispanic women obtained prenatal care as early as Black women, the impact on the overall state first trimester care rate is estimated to yield a gain of two percentage points.

Infrastructure Building Services: Children

National Performance Measure 12

Percent of all children in the state without health insurance

The target set for FY 01 is 10 percent, as measured by the American Academy of Pediatrics

(AAP); a change has been made in the source for the data, switching to the AAP and from the Colorado BRFSS due to problems in collecting data annually. Form 11 shows actual levels of 18.1 percent in FY 97, 14.1 percent in FY 98, and 11.8 percent in FY 99. With expanded coverage enacted in federal legislation in 1997, and in state legislation in 1998, we anticipate a further reduction in this proportion in the next few years. Fewer children in the state should be uninsured, covered either by Child Health Plan Plus or covered by Medicaid (identified as eligible when application is made for Child Health Plan Plus).

As noted previously, Colorado has begun to receive funding from the Robert Wood Johnson Foundation for its Covering Kids Initiative; CDPHE is the lead agency for this three-year effort to improve outreach and enrollment in CHP+ and Medicaid. Activities include coordination of existing coverage programs by development and simplification of a single, consolidated application; simplification of the process for families to enroll their children by reducing all barriers possible, including procedures, transportation, distance, scheduling, language, culture, stigma associated with the application, and access to information; development of community networks to ease the enrollment process, through training of staff and parents in community organizations and institutions; and the implementation of a coordinated marketing campaign to reach underserved groups and motivate their enrollment in coverage plans.

As a result of the grant award, it is anticipated that the proportion of children without insurance in Colorado will drop in response to the above efforts. By FY 03, the proportion uninsured is anticipated to drop to 9.0 percent.

National Performance Measure 13

Percent of potentially Medicaid-eligible children who have received a service paid for by the Medicaid Program

The target for FY 01 is 95 percent. The FY 99 percentage was estimated at 87 percent. An annual improvement of 5,000 new enrollees out of the estimated pool of 25,000 potentially-eligible but unenrolled children yields an improvement of about two percentage points each year. The targets are based on the FY 99 estimate, which does not take into account children who may have other insurance but who are nevertheless eligible for some Medicaid services that are not covered by that insurance.

National Performance Measure 16

The rate (per 100,000) of suicide deaths among youths age 15-19

The FY 01 target is 14.0 suicide deaths per 100,000 youths. In 1998, the rate was 13.6, and rates in 1996 and 1995 (but not 1997) were even lower. The suicide rate continues to be volatile.

In May 2000, the Colorado Legislature passed a bill creating a suicide prevention program within the Colorado Department of Public Health & Environment to work with state partners and local communities to implement the recommendations of the 1998 Governor's Commission on Suicide Prevention. While this program will target suicide prevention for all ages, youth suicide prevention will be a focus. The intent of the legislation is to build local capacity to be more effective in suicide prevention. There are several options for where this program will be located and how it will be implemented within the Department. However, it is a given that adolescent and school health personnel will be actively involved with this effort.

During FY 01, our strategy to prevent adolescent suicide will continue to focus on making mental health services accessible. School-based health centers play a vital role in linking students at risk with counselors who can assess their needs. Locating mental health services in schools with physical health services significantly reduces barriers to their use. Adolescents, including middle school students, actively seek out these services, and mental health problems are often identified in the course of the delivery of medical health services. In established school-based health centers, thirty to forty percent of all visits are for mental health problems. It should be noted that other publicly funded mental health programs address the needs of only the most severely disturbed children who comprise one to two percent of their age group. It is not unusual for ten percent or more of students attending a school with a school-based health center to receive mental health care during the course of a school year.

State Performance Measure 7

The proportion of children and adolescents attending public schools who have access to research-based health education and to basic preventive and primary, physical and behavioral health services through school-based health centers

The FY 01 target is set at 5.1 percent of all students attending public schools. This target will be achieved through the addition of at least two more schools and an increase of over 5,000 students over the FY 98 level. Planning grants awarded in FY 98 and 99 are proving successful in generating community interest and support for school-based health.

State Performance Measure 8

The percent of Medicaid-eligible children who receive dental services as part of their comprehensive services

The target for FY 01 has been set at 25 percent. Without the desired increase in Medicaid provider reimbursement levels, it is doubtful there will be a significant increase in the number of Medicaid dental providers and therefore, very little increase in the number of children served.

However, the billing difficulties with Consultec, Inc. have vastly improved with the ability to now accept "batch billing," allowing dentists to use their claim forms and submit for payment through a third party billing service. The Commission on Children's Dental Health, convening beginning in May 2000 for six months, will be considering design and implementation of a dental provider network for SCHIP, which will certainly involve discussions of Medicaid as the providers will most likely be the same. A final report is due to be released in December 2000.

Infrastructure Building Services: Children with Special Health Care Needs

National Performance Measure 11

Percent of children with special health care needs in the state CSHCN Program with a source of insurance for primary and specialty care

The target set for FY 01 is 78 percent. This target is new, based on FY 99 data available from the IRIS system for the first time.

With no substantive legislative activity to increase either the benefits or the financial eligibility guidelines or to add undocumented children to the state child health insurance plan, it is unlikely that the insurance coverage for children enrolled in HCP will change in the next year. It is planned that a thorough analysis of the data from the new IRIS system will provide more information about the kinds of insurance that children have and whether it is adequate to cover the service and support needs identified.

National Performance Measure 14

The degree to which the state assures family participation in program and policy activities in the state CSHCN program

The target number on the checklist of family participation for FY 01 is 15 out of a possible 18. With parents hired in each of the thirteen regional offices, we have seen an explosion of activity at the local level in the last year. We expect that this level of activity will continue and even grow as the role of the parents becomes more institutionalized. In addition, we plan to increase the amount of time for a Parent Consultant at the state level. It is clear that a half-time position is not enough with the increased needs for orientation, training and coordination of the thirteen parents in the regional offices. In addition, while there is clear benefit to having a parent on the state staff, we feel there are also advantages to having formal connections to parents who are not part of the state system. Over the long run, we think that having parents on contract with the state will give us a degree of distance from the state bureaucracy that may provide a more independent view of the role of HCP in the state systems building efforts. It will also allow a little more work in the area of advocacy for the policy efforts on behalf of children with special health care needs. The plan for next year is to continue the half-time position and to add some time from one or more parents on contract to increase training, policy and advocacy efforts and to coordinate more with Family Voices in Colorado.

State Performance Measure 11

The degree to which the State supports data analysis and dissemination of results for local and state MCH planning

Fiscal year 01 is the first year for this performance measure. This measure replaces State Performance Measure 9, the measure tracking IRIS (Integrated Registration and Information System). The new measure expands our definition of improving state and local infrastructure by seeking to measure increased capacity at the state and local levels around data issues.

Baseline data for the measure will be determined during FY 01, and targets for future years will be set after the baseline figure is known. At this time, a 10 point scale is proposed. A survey tool will be developed to measure both state and local efforts to support data analysis and dissemination. The tool will include questions regarding whether local data are calculated/available and provided easily (e.g., through a department website), whether data are maintained and updated; whether technical assistance is provided to locals and how well it is provided; and whether, at the state level, critical and emerging maternal and child health issues are analyzed.

State Performance Measure 10

The rate of homicides among teens 15-19 and among black male teens

The FY 01 target for all teens is 5.5 deaths per 100,000 teens, a target that was set some years ago and has not yet been attained. While the 1996 rate was 6.4, the 1997 rate rose to 9.4 , and the 1998 rate was 11.3 (34 homicide deaths among 300,377 teens age 15-19). Like the suicide rate, this rate is very volatile, and attainment of a given low rate depends on many factors.

On April 20, 1999, twelve teenagers were among those shot and killed at Columbine High School in Jefferson County, in the largest school shooting in history.⁴ These deaths will be part of our calendar 1999 homicide data reported next year for FY 00, making it highly unlikely that our target rate of 5.5 will be met in that year. To meet the target, the number of teen homicides in all of 1999 must have been 16 or fewer (data not yet available).

The public reaction to the school shootings has been enormous, and it is hoped that this reaction will some day result in a reduction of the level of violence in our society. One of the key factors in reducing mortality in the near future appears to lie in reducing access to firearms, however. The Colorado Legislature did not pass legislation in 2000 that would have reduced access to weapons through requiring background checks at all gunshow sales. However, Governor Owens reinstated the state background check in late 1999, with legislative approval in 2000 that requires background investigation broader than that required federally.

⁴ There were a total of 13 homicides: twelve students and one teacher, two suicides (of the teenage student gunmen), and more than 20 additional students injured, many critically.

The Child Fatality Review Committee released a Firearms Child Fatalities report in May 2000. A number of prevention strategies were cited, including storage of firearms unloaded, locked, with ammunition in a separate location, and removing firearms from homes with troubled adolescents (this has an impact on the suicide rate as well).

Our School and Adolescent Health Promotion and School-Based Health Center Initiative for FY 99, applying to grants through FY 01, requested that community projects be designed to reduce a variety of negative teen behaviors, including teen homicide rates. Community partnerships are being organized to support population-based approaches and to support the infrastructure of a community. Programs which use multiple resources should be able to support teens in a variety of positive activities, which ultimately should reduce violence.

The Colorado Department of Public Health & Environment works in many ways to develop community-wide programs for early identification and intervention for adolescents at risk, and to support the role of positive youth development, community recreation and economic development programs as important tools in violence prevention. The CASH Director is part of a state Safe Communities-Safe Schools Advisory Board. This is an initiative funded by the Colorado Trust and being implemented by the Center for the Study and Prevention of Violence at the University of Colorado in Boulder with the endorsement of the Governor's Office and the Office of the State Attorney General. Other partners include the Colorado Association of School Boards, the Colorado Association of School Executives, the Colorado Education Association, the Colorado Department of Education, law enforcement, probation, the Urban League, Safe and Drug-Free Schools and others. We anticipate that the growth of these kinds of initiatives will over the long run impact the teen homicide rate.

For black male teens, the target is again being set at 50 per 100,000 for FY 00. If the recent low level attained in calendar 1996 (44.2 per 100,000, based on three deaths) can be attained again (there were four deaths in 1998), the target can be met. A variety of coordinated efforts in areas with large minority populations have the opportunity to make an impact, and the new Healthy People 2010 initiative to reduce disparities among different racial and ethnic groups in the first decade of the new century should contribute toward their success.

Summary

Section 4.1 on the preceding pages has provided information on the program activities which will take place in FY 01. Each of the twenty-eight performance measures has been listed with a brief description of the plans for the upcoming fiscal year. The next section, 4.2, covers other important program activities which have not already been discussed.

4.2 Other Program Activities

A variety of other programs are described here as requested by the guidance.

Toll-Free Hotline

The Family Healthline is a statewide information and referral service located at the Colorado Department of Public Health & Environment. Healthline Resource Specialists assist callers, particularly pregnant women, families, and individuals in locating free or low-cost health care services, especially for children. Information is also provided about other programs such as emergency shelters, food subsidies, mental health, or parenting support groups. The Healthline Specialists speak both Spanish and English and arrangements are made for assisting the hearing impaired and speakers of other languages. The Healthline operates as part of the Women's Health Section in the Family and Community Health Services Division.

Each call to the Healthline is recorded in a database where demographic and other call information is stored for reference and planning purposes. The Healthline Specialist is able to make referrals for callers, usually within their own communities. Individuals will often contact the Healthline more than one time once they recognize the extensiveness of the referral database. The Healthline's referral network covers many categories, from low-cost or free medical care to mental health services to housing and other basic subsistence resources. The database allows the Healthline specialist to refer back to the original call for greater efficiency and better customer service. Callers are directed to additional appropriate services in their communities.

After the caller information is stored in the database, periodic reports are generated which detail certain caller demographics (age, location, trimester if woman is pregnant, etc.), information requested by caller (i.e. Medicaid providers, Immunizations, WIC, etc.), and the outcome of the call (information only, information and referral). The database also has the capability to track whether a call is the result of a specific state or national campaign. The data is very useful for planning efforts in the Family and Community Health Division.

In the spring of 1999, the Healthline updated its system to a new database software program. This new system provides increased capability for collecting and tracking caller information, making referrals to appropriate programs, sending follow-up letters when necessary, and preparing summary reports for review. Long term plans include providing Internet capability where interested parties can log in through a web site and then be able to query the database for programs meeting specific needs.

Sudden Infant Death Program

The Colorado Sudden Infant Death Program should also be mentioned here. The primary purpose of the program is to provide early intervention through information and counseling to those persons affected by the sudden death of an infant. There is a statewide network of public health nurses, parents, and volunteers, who provide services to parents, relatives, friends, day care providers, etc. The mission of the Program includes assuring that emergency medical personnel

understand SIDS and are able to provide accurate and appropriate information to the family.

During FY 99, the program provided risk reduction information to every licensed child care provider and facility in the state. Bench ads advocating Risk Reduction and Back to Sleep were continued in the metro Denver area, with a phone number for additional information. In FY 99, a total of 86 educational presentations were made to 1,960 individuals in Boulder, Douglas County, Kit Carson County, Lincoln County, Glenwood Springs, Canon City, Longmont, Fort Collins, Brighton, Loveland, Pueblo, Colorado Springs, and throughout metro Denver.

The Program continues maintaining its Web site, set up in FY 98, which can be found at "www.coloradosids.org". The site describes the organization, the services that it provides, and offers materials about Sudden Infant Death.

During FY 00, the program is using PRAMS data which details sleep position by race, location (Denver Metro, Other Urban, and Rural), and other demographic and risk factors. The program is focusing on minority groups and populations experiencing higher than average SIDS deaths. In addition, the program is working with Aurora Healthy Start through the Metropolitan Denver Provider Network (MDPN), in a two zip-code area of high need.

In FY 01, the Program plans to use a new database system that facilitates the comparison of its data with PRAMS data. The new system also will allow deaths to be related to birth cohorts rather than the current system that relates deaths to births in the same year.

Also during FY 01, door hangers with SIDS risk reduction information will be distributed to all new babies born at the San Luis Valley Regional Medical Center in Alamosa in southern Colorado. Transit ads will be produced for El Paso and Pueblo counties, also in the south.

The efforts to disseminate risk reduction information to churches and senior programs throughout the state will be completed in FY 01. This effort reaches seniors, care providers other than parents, and grandparents raising grandchildren.

WIC Program

During FY 01 the Colorado WIC Program will provide eligibility determination, supplemental foods, nutrition education, and breastfeeding support to 130,500 participants. WIC will also continue its work on an obesity reduction initiative for children, to enhance the collection of health outcome data, to convert the WIC benefits computer system from DOS to Windows-based software, and to develop a funding formula for dispersing grant funds to local agencies. More information on WIC can be found at <http://www.cdphe.state.co.us/fc/wic/wichom.asp>.

Social Security Administration (SSA)

Relationships with the State Determination Unit of the Social Security Administration are strong.

Information is passed between CDPHE and SSA through newsletters, phone calls, e-mails and meetings. The Health Care Program for Children with Special Needs continues to receive computer reports on a monthly basis, listing the new SSI beneficiaries. EPSDT Outreach Workers at the local level make calls to these families to assess whether service and support needs are being met. When family needs are complex and the EPSDT Outreach Work feels that Care Coordination by an HCP staff member would be appropriate, the referral is made.

Vocational Rehabilitation

Relationships with Vocational Rehabilitation in the Department of Human Services also remain strong. A formal Memorandum of Understanding was completed and ready for signature when new Executive Directors at both CDPHE and Human Services were appointed in January 1999. While we are working under the principles agreed upon in the draft, the document has never been signed due to changes in the legal interpretation of the document by department lawyers and by the retirements of the principal contacts in each agency. It is expected that the document will be reviewed and signed in the coming year.

State Developmental Disabilities

This section of the Colorado Department of Human Services has been discussed or referred to elsewhere in the grant (page 25, 93, and 95).

4.3 Public Input

In April 2000, a request was received from the Institute for Child Health Policy in Florida for an electronic copy of Colorado's MCH grant applications submitted in 1998 and 1999. The Institute plans to create a CD-ROM containing the narratives of all state applications, and also plans to create a website with the same information. The Family and Community Health Services Division was able to respond that the Colorado grant was already available on the state's Website. The Institute's Director of Policy and Program Affairs in charge of this project was surprised, commenting, "Colorado is one of the few states in the nation that has made their MCH Block Grant Application available on the Web. (My congratulations to Colorado!) I would like to encourage other states to follow the leadership of Colorado in making the narrative and performance measure components of the Block Grant available."

On May 31, 2000 a draft of this application was placed on the Colorado Department of Public Health & Environment Web site, at "<http://www.cdphe.state.co.us/fc/mch/newmchgrant.asp>." Notification was sent to local nursing directors and local public health agencies, the statewide Advisory Council on Health Programs for Women and Children, the Advisory Council on Adolescent Health, and other interested parties. These people were encouraged to download the application and to comment on its substance by e-mail. The following comments were representative of those received:

- The Colorado Primary Care Association stated that “this is the best MCH grant ever.”
- An epidemiologist member of the Colorado Health Data Advisory Committee (CoHDAC) commented, “The document is very well written. It is clean (no typos), summarizes information well, and includes some key material the federal government needs to know (about CoHID, about state legislative actions, and about IRIS, just to cite a few examples.) The style of writing is simple and easy to follow. Everything I saw, to my knowledge, was accurate about the portrayal of Colorado's situation.”
- A health planner from Boulder wrote, “The Health Status section is an impressive piece of work and was very well written.” She questioned why Healthy People 2000 objectives were used and not Health People 2010 objectives. She also wondered why some perinatal data are presented by region or county and not others, e.g., unintended pregnancy. In addition, she noted that there were relatively fewer national data comparisons for data points in the child and adolescent sections; comparisons would be helpful, especially national YRBS data. [Additional national comparisons were made after this comment was received.]

Other comments submitted included:

- The application “home page” allowed me to easily find the sections I wanted without having to download the entire grant.
- I liked the color picture showing the terrain and cities on the first page.
- Data for the health status/performance measure items are spread over three sections. There were two instances where the same indicator appears in three separate places: motor vehicle deaths for ages 1-14 and tobacco use among teens. There are many more of the indicators which appear in two of the three sections. You may be constrained by a specific format required by the federal government, but it seems to make for a great deal of flipping back and forth to make comparisons.
- The health status section is very well organized and the use of color graphs and maps to illustrate the text is very effective. One can visualize the data with the charts and maps. I was able to download from the Internet and print out the section with the color charts intact. These new tools make it very easy to understand the concisely written text.
- I was encouraged to see the improvement in early prenatal care which I know has been a long-term goal of the Division and Department. It is encouraging that more blacks are getting into care early; not so long ago this group was considered very hard to reach.
- The low birth weight rate is disappointing. More tobacco settlement money should be used to

decrease smoking in pregnancy as well as smoking in general.

- The Health Status section is easy to understand and superbly illustrated with graphs and maps. Overall I am pleased to see the progress made in health status during the 90's.
- The application is very comprehensive and very well done.

Finally, on June 28, 2000, a public hearing was held at the Colorado Department of Public Health & Environment during the regular meeting of the Advisory Council on Health Programs for Women and Children. The following comments were made during the hearing regarding the block grant application:

- This document is written in a way that parents in the community can read and understand the efforts of the maternal and child health program.
- The document discusses Hispanic health disparities and issues, but does not adequately distinguish the impact of new, recent immigrants vs. residents of Hispanic ethnicity who have been in Colorado for a long time. The grant would have benefited from discussion of this difference, since behaviors between the two groups may vary.
- There is a downturn in the 1998 first trimester prenatal care began rate, from the high experienced in 1997. Could this change be due to a falling TANF caseload? Women who are no longer “in the system” may take longer to begin care when they become pregnant.
- PRAMS data can be used to study the above question; it is also important to see if the downturn was followed in 1999 by another drop, or if the 1998 year was an aberration.
- Is there a standard definition used for reporting race? Definitions appear to be political; what definitions are used in the data reported in this grant, especially for health status?
- The Department of Public Health and Environment uses census definitions for race (essentially self-report) and categories suggested on the birth and death certificate (Native American, black) in its health statistics reports. These change only about every ten years, may not reflect current popular usage, i.e., Latina or Latino for Hispanic; African-American for black, etc.
- The grant is exceptionally thorough and matches the direction given for the writing of the grant. As a past federal grant reviewer, I can attest that this is not always the case. I am very impressed by all of the work at the state and local level expressed. A person from outside your agency doesn't often get to see the “big picture,” or to comprehend the many, many dedicated workers and hours of work it takes to accomplish the tasks.

- There is a statement in Section 1.5.2 regarding the lack of interest among school officials for establishing new school-based health centers due to the focus on testing. At the Colorado Department of Education, Prevention Initiatives is collecting research that speaks to good health being a prerequisite to learning. North High School in Denver is an example of a school that has made the connection of their school-based health center to increased academic achievement.
- I was encouraged to read of the emphasis on positive youth development for adolescents.
- The hiring of parents to assure family participation in program and policy activities in all of the thirteen centers (for CSHCN) was exceptional.
- The needs assessment process includes many sources of input, insuring a plan to meet varied needs.
- In Section 4.1 on page 132 the grant discusses the importance of driver's training. Governor Romer's DUI Task Force reviewed the research that did not show any particular success for driver training. Is there new research that shows otherwise?
- The Child Fatality Review Committee has determined that driver inexperience is a major factor in car crashes and fatalities. Graduated licensing is one strategy to address this problem; hands-on driver training is another. The research that is often cited regarding the ineffectiveness of driver education was limited to classroom driver training. Actual driving experience is an added element which must be part of driving training.
- The Health Status section clearly states that 1997 and 1999 Youth Risk Behavior Survey data is unweighted and that it should be used cautiously. However, it does go on to compare the data with previous years and to draw conclusions. It might have been advisable to use other sources of data to corroborate the apparent values; Denver Public Schools is a large system that has a great deal of behavioral data that would be useful.
- There are several statements in the grant regarding the difficulty of ascribing increases or decreases in data results to MCH efforts. We should spend some energy thinking about measuring the impact of the MCH programs, especially in combination with other efforts by other programs, such as the Department of Education. Many programs have synergistic effects. While this area of evaluation is difficult, it would be worthwhile to give some thought to how better measurement could be accomplished.
- The grant is very long. An effort should be made by the MCH Bureau to consolidate sections.

After transmittal in July 2000 to the Maternal and Child Health Bureau, the final Maternal and

Child Health Application and Annual Report for FY 01 will be distributed to all members of the Advisory Council on Health Programs for Women and Children at its August meeting. Copies will also be available to answer requests during FY 01 regarding the activities of the Family and Community Health Services Division. Most importantly, the entire document will be available on our Internet site, located at <http://www.cdphe.state.co.us/fc/fchom.asp>. Visitors to the site will be able to download the application and will be able to e-mail the Division with their comments and questions throughout the year. This is the second year that the block grant will have been placed on the Internet.

4.4 Technical Assistance

Colorado's technical assistance needs are shown on Form 15.

Under General Systems Development, we are seeking an expert in Internet and medical security for the IRIS system. Policies and procedures are needed. We also are seeking strategies for improved integration of WIC with child and adolescent health, EPSDT (including blood level testing), and CHIP outreach. These programs often operate in isolation of one another in the Family and Community Health Services Division.

Under Data-Related Requests, we are seeking a national expert in needs assessment for Children with Special Health Care Needs to assist with planning. Under Other, a national expert is sought to provide expertise on Hispanic teen fertility reduction.

V. SUPPORTING DOCUMENTS

5.1 Glossary

This section begins on page 150. The Glossary consists of eight pages of definitions of terms that are used in the application.

5.2 Assurances and Certifications

This five-page section follows the Glossary.

5.3 Other Supporting Documents

There are a number of supporting documents included in this application. The first is a one-page listing of the members of the Advisory Council on Adolescent Health (page 165). The second is a listing of the members of the Advisory Council on Health Programs for Women and Children (page 166). The third is a 19-page document titled, “Care Coordination for Children with Special Health Care Needs-A Public Health Model” (beginning on page 167).

The fourth item is a 16-page writeup of the Child Care Assessment Survey, called “Colorado Child Care Assessment: Need for Nurse Consultation Services, 1999,” beginning on page 186. The survey writeup is followed by several pages of Data Values for MCH Indicators (page 202-205). These values appear in the Needs Assessment section of the grant as data elements in the figures and maps in the health status section. Following the Data Values, there is a two-page statement of the Family and Community Health Services Division Vision of the Future, Mission, Values, and Goals (page 206).

The four-page Firearm Child Fatalities Brief is after the Division Vision statement (page 208).

A ten-page Colorado Maternal Mortality Review Committee Brief (beginning on page 212) follows the Firearm Child Fatalities Brief. (The Maternal Mortality Brief was in a draft version at the time this grant was submitted.) The MCH County Data Set Examples are included next (pages 222-226). Such data are available for all 63 counties through the Division website. The Motor Vehicle Brief follows the MCH County Data Set Examples (page 227).

A 37-page summary of Current Issues for Children with Special Health Care Needs in Colorado is next, beginning on page 231.

The Title V Block Grant Funding Methodology Description can be found beginning on page 268.

The next document is titled “Workshops and Training Sessions Conducted or Sponsored by HCP,” on page 271.

The Colorado Department of Public Health & Environment low birth weight report, *Tipping the Scales: Weighing in on Solutions to the Low Birth Weight Problem in Colorado* is the last supporting document, beginning on page 272. The report is 38 pages.

Forms 2 through 15 are included after the Other Supporting Documents section. Notes for all forms are to be found at the very end of this document. Please refer to these last few pages when “See Note” is shown on a form; there are notes for most of the forms. In some cases, especially concerning national performance measures, “See Note” could not be entered on the electronic form. It is advisable to look at the Notes page to determine if there is special additional information for each of the forms.

Forms 2, 3, 4 and 5 are financial forms. Form 6 is the Newborn Screening form. Forms 7 and 8 shows numbers of individuals served under Title V and Title XIX, while Form 9 provides information on the toll-free telephone line. Form 10 contains a two-page summary of the MCH programs in Colorado. Form 11 is 26 pages long, and includes data for tracking each performance measure. Form 12 has a number of pages which provide information on each of the outcome measures.

Form 13 contains information on the scoring for the service system constructs for the Health Care Program for Children with Special Needs. Form 14 is the list of Colorado’s priority needs.

Form 15 contains the state’s requests for technical assistance.

Please note that the forms have a different numbering system from the paging for the text of the application.

5.4 Core Health Status Indicator Forms

These forms contain information on asthma, adequacy of primary care for Medicaid children, adequacy of care for pregnant women, and low birth weight and very low birth weight rates for all births and for singleton births. In addition, these forms contain Medicaid/non-Medicaid comparisons relating to births and infant deaths, Colorado eligibility guidelines for Medicaid and the Child Health Plan Plus, and data capacity information relating to linkage and data availability to the Title V program.

5.5 Core Health Status Indicator Detail Sheets

A one-page detail sheet is provided for each of the core health status indicators. The detail sheets show the goal of the performance measure, define the numerator and denominator, cite the

Healthy People 2010 objective, discuss data source and data issues, and describe the significance of the measure.

5.6 Developmental Health Status Indicator Forms

These forms contain information on death rates due to unintentional injury, due to motor vehicle crashes, and hospitalization rates for the same factors.

5.7 Developmental Health Status Indicator Detail Sheets

A one-page detail sheet is provided for each of the developmental health status indicators. The detail sheets show the goal of the performance measure, define the numerator and denominator, cite the Healthy People 2010 objective, discuss data source and data issues, and describe the significance of the measure.

5.8 All Other Forms

Forms 2 through 15 are included here. A list is provided in the Table of Contents on page 4.

5.9 National “Core” Performance Measure Detail Sheets

Following Form 15, Form 16 consists of eighteen detail sheets for the eighteen “core” performance measures.

5.10 State “Negotiated” Performance Measure Detail Sheets

The ten detail sheets for Colorado’s ten additional performance measures are included after the national performance measure detail sheets.

5.11 Outcome Measure Detail Sheets

The outcome measure detail sheets for the nation (numbers 1 through 6) and Colorado’s one outcome measure concerning low birth weight are included immediately following the state detail sheets.

Following the detail sheets are the “Notes for Forms 1 through 16.” These notes include important information about the data contained on many of the forms.

This page completes the text of the application.

GLOSSARY

Administration of Title V Funds - The amount of funds the State uses for the management of the Title V allocation. It is limited by statute to 10 percent of the Federal Title V allotment.

Assessment - (see "Needs Assessment")

Capacity - Program capacity includes delivery systems, workforce, policies, and support systems (e.g., training, research, technical assistance, and information systems) and other infrastructure needed to maintain service delivery and policy making activities. Program capacity results measure the strength of the human and material resources necessary to meet public health obligations. As program capacity sets the stage for other activities, program capacity results are closely related to the results for process, health outcome, and risk factors. Program capacity results should answer the question, "What does the State need to achieve the results we want?"

Capacity Objectives - Objectives that describe an improvement in the ability of the program to deliver services or affect the delivery of services.

Care Coordination Services for CSHCN - Those services that promote the effective and efficient organization and utilization of resources to assure access to necessary comprehensive services for children with special health care needs and their families. *[Title V Sec. 501(b)(3)]*

Carryover (as used in Forms 2 and 3) - The unobligated balance from the previous year's MCH Block Grant Federal Allocation.

Case Management Services - For pregnant women - those services that assure access to quality prenatal, delivery and postpartum care. For infants up to age one - those services that assure access to quality preventive and primary care services. *[Title V Sec. 501(b)(4)]*

Children - A child from 1st birthday through the 21st year, who is not otherwise included in any other class of individuals.

Children With Special Health Care Needs (CSHCN) - *(For budgetary purposes)* Infants or children from birth through the 21st year with special health care needs who the State has elected to provide with services funded through Title V. CSHCN are children who have health problems requiring more than routine and basic care including children with or at risk of disabilities, chronic illnesses and conditions and health-related education and behavioral problems. *(For planning and systems development)* Those children who have or are at increased risk for chronic physical, developmental, behavioral, or emotional conditions and who also require health and related services of a type or amount beyond that required by children generally.

Children With Special Health Care Needs (CSHCN) - Constructs of a Service System

1. State Program Collaboration with Other State Agencies and Private Organizations

States establish and maintain ongoing interagency collaborative processes for the assessment of needs with respect to the development of community-based systems of services for CSHCN. State programs collaborate with other agencies and organizations in the formulation of coordinated policies, standards, data collection and analysis, financing of services, and program monitoring to assure comprehensive, coordinated services for CSHCN and their families.

2. State Support for Communities

State programs emphasize the development of community-based programs by establishing and maintaining a process for facilitating community systems building through mechanisms such as technical assistance and consultation, education and training, common data protocols, and financial resources for communities engaged in systems development, to assure that the unique needs of CSHCN are met.

3. Coordination of Health Components of Community-Based Systems

A mechanism exists in communities across the State for coordination of health services with one another. This includes coordination among providers of primary care, habilitative and rehabilitative services, other specialty medical treatment services, mental health services, and home health care.

4. Coordination of Health Services with Other Services at the Community Level

A mechanism exists in communities across the State for coordination and service integration among programs serving CSHCN, including early intervention and special education, social services, and family support services.

Classes of Individuals - Authorized persons to be served with Title V funds. See individual definitions under "Pregnant Women," "Infants," "Children with Special Health Care Needs," "Children," and "Others."

Community - A group of individuals living as a smaller social unit within the confines of a larger one due to common geographic boundaries, cultural identity, a common work environment, common interests, etc.

Community-based Care - Services provided within the context of a defined community.

Community-based Service System - An organized network of services that are grounded in a

plan developed by a community and that is based upon needs assessments.

Coordination (see Care Coordination Services)

Culturally Sensitive - The recognition and understanding that different cultures may have different concepts and practices with regard to health care; the respect of those differences and the development of approaches to health care with those differences in mind.

Culturally Competent - The ability to provide services to clients that honor different cultural beliefs, interpersonal styles, attitudes and behaviors and the use of multicultural staff in the policy development, administration and provision of those services.

Deliveries - Women who received a medical care procedure associated with the delivery or expulsion of a live birth or fetal death (gestation of 20 weeks or greater).

Direct Health Services - Those services generally delivered one-on-one between a health professional and a patient in an office, clinic or emergency room which may include primary care physicians, registered dietitians, public health or visiting nurses, nurses certified for obstetric and pediatric primary care, medical social workers, nutritionists, dentists, sub-specialty physicians who serve children with special health care needs, audiologists, occupational therapists, physical therapists, speech and language therapists, specialty registered dietitians. Basic services include what most consider ordinary medical care: inpatient and outpatient medical services, allied health services, drugs, laboratory testing, x-ray services, dental care, and pharmaceutical products and services. State Title V programs support - by directly operating programs or by funding local providers - services such as prenatal care, child health including immunizations and treatment or referrals, school health and family planning. For CSHCN, these services include specialty and subspecialty care for those with HIV/AIDS, hemophilia, birth defects, chronic illness, and other conditions requiring sophisticated technology, access to highly trained specialists, or an array of services not generally available in most communities.

Enabling Services - Services that allow or provide for access to and the derivation of benefits from, the array of basic health care services and include such things as transportation, translation services, outreach, respite care, health education, family support services, purchase of health insurance, case management, coordination with Medicaid, WIC and education. These services are especially required for the low income, disadvantaged, geographically or culturally isolated, and those with special and complicated health needs. For many of these individuals, the enabling services are essential - for without them access is not possible. Enabling services most commonly provided by agencies for CSHCN include transportation, care coordination, translation services, home visiting, and family outreach. Family support activities include parent support groups, family training workshops, advocacy, nutrition and social work.

Family-centered Care - A system or philosophy of care that incorporates the family as an integral component of the health care system.

Federal (Allocation) (as it applies specifically to the Application Face Sheet [SF 424] and Forms 2 and 3) -The monies provided to the States under the Federal Title V Block Grant in any given year.

Government Performance and Results Act (GPRA) - Federal legislation enacted in 1993 that requires Federal agencies to develop strategic plans, prepare annual plans setting performance goals, and report annually on actual performance.

Health Care System - The entirety of the agencies, services, and providers involved or potentially involved in the health care of community members and the interactions among those agencies, services and providers.

Infants - Children under one year of age not included in any other class of individuals.

Infrastructure Building Services - The services that are the base of the MCH pyramid of health services and form its foundation are activities directed at improving and maintaining the health status of all women and children by providing support for development and maintenance of comprehensive health services systems including development and maintenance of health services standards/guidelines, training, data and planning systems. Examples include needs assessment, evaluation, planning, policy development, coordination, quality assurance, standards development, monitoring, training, applied research, information systems and systems of care. In the development of systems of care it should be assured that the systems are family centered, community based and culturally competent.

Local Funding (as used in Forms 2 and 3)-Those monies deriving from local jurisdictions within the State that are used for MCH program activities.

Low Income - An individual or family with an income determined to be below the income official poverty line defined by the Office of Management and Budget and revised annually in accordance with section 673(2) of the Omnibus Budget Reconciliation Act of 1981. [*Title V, Sec. 501 (b)(2)*]

MCH Pyramid of Health Services - (see “Types of Services”)

Measures - (see “Performance Measures”)

Needs Assessment - A study undertaken to determine the service requirements within a jurisdiction. For maternal and child health purposes, the study is aimed at determining:

- 1) What is essential in terms of the provision of health services;
- 2) What is available, and
- 3) What is missing.

Objectives - The yardsticks by which an agency can measure its efforts to accomplish a goal.

(See also “Performance Objectives”)

Other Federal Funds (Forms 2 and 3) - Federal funds other than the Title V Block Grant that are under the control of the person responsible for administration of the Title V program. These may include, but are not limited to: WIC, EMSC, Healthy Start, SPRANS, AIDS monies, CISS funds, MCH targeted funds from CDC and MCH Education funds.

Others (as in Forms 4, 7, and 10) - Women of childbearing age, over age 21, and any others defined by the State and not otherwise included in any of the other listed classes of individuals.

Outcome Objectives - Objectives that describe the eventual result sought, the target date, the target population, and the desired level of achievement for the result. Outcome objectives are related to health outcome and are usually expressed in terms of morbidity and mortality.

Outcome Measure - The ultimate focus and desired result of any set of public health program activities and interventions is an improved health outcome. Morbidity and mortality statistics are indicators of achievement of health outcome. Health outcomes results are usually longer term and tied to the ultimate program goal. Outcome measures should answer the question, “Why does the State do our program?”

Performance Indicator - The statistical or quantitative value that expresses the result of a performance objective.

Performance Measure - A narrative statement that describes a specific maternal and child health need, or requirement, that, when successfully addressed, will lead to, or will assist in leading to, a specific health outcome within a community or jurisdiction and generally within a specified time frame. (Example: “The rate of women in [State] who receive early prenatal care in 19__.” This performance measure will assist in leading to [the health outcome measure of] reducing the rate of infant mortality in the State).

Performance Measurement - The collection of data on, recording of, or tabulation of results or achievements, usually for comparing with a benchmark.

Performance Objectives - A statement of intention with which actual achievement and results can be measured and compared. Performance objective statements clearly describe what is to be achieved, when it is to be achieved, the extent of the achievement, and target populations.

Population Based Services - Preventive interventions and personal health services, developed and available for the entire MCH population of the State rather than for individuals in a one-on-one situation. Disease prevention, health promotion, and statewide outreach are major components. Common among these services are newborn screening, lead screening, immunization, Sudden Infant Death Syndrome counseling, oral health, injury prevention, nutrition and outreach/public education. These services are generally available whether the mother or child receives care in the private or public system, in a rural clinic or an HMO, and

whether insured or not.

Pregnant Woman - A female from the time that she conceives to 60 days after birth, delivery, or expulsion of fetus.

Preventive Services - Activities aimed at reducing the incidence of health problems or disease prevalence in the community, or the personal risk factors for such diseases or conditions.

Primary Care - The provision of comprehensive personal health services that include health maintenance and preventive services, initial assessment of health problems, treatment of uncomplicated and diagnosed chronic health problems, and the overall management of an individual's or family's health care services.

Process - Process results are indicators of activities, methods, and interventions that support the achievement of outcomes (e.g., improved health status or reduction in risk factors). A focus on process results can lead to an understanding of how practices and procedures can be improved to reach successful outcomes. Process results are a mechanism for review and accountability, and as such, tend to be shorter term than results focused on health outcomes or risk factors. The utility of process results often depends on the strength of the relationship between the process and the outcome. Process results should answer the question, "Why should this process be undertaken and measured (i.e., what is its relationship to achievement of a health outcome or risk factor result)?"

Process Objectives - The objectives for activities and interventions that drive the achievement of higher-level objectives.

Program Income (as used in the Application Face Sheet [SF 424] and Forms 2 and 3) - Funds collected by State MCH agencies from sources generated by the State's MCH program to include insurance payments, MEDICAID reimbursements, HMO payments, etc.

Risk Factor Objectives - Objectives that describe an improvement in risk factors (usually behavioral or physiological) that cause morbidity and mortality.

Risk Factors - Public health activities and programs that focus on reduction of scientifically established direct causes of, and contributors to, morbidity and mortality (i.e., risk factors) are essential steps toward achieving health outcomes. Changes in behavior or physiological conditions are the indicators of achievement of risk factor results. Results focused on risk factors tend to be intermediate term. Risk factor results should answer the question, "Why should the State address this risk factor (i.e., what health outcome will this result support)?"

State - As used in this guidance, includes the 50 States and the 9 jurisdictions of the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, the Republic of the Marshall Islands, the

Federated States of Micronesia and the Republic of Belau.

State Funds (as used in Forms 2 and 3) - The State's required matching funds (including overmatch) in any given year.

Systems Development - Activities involving the creation or enhancement of organizational infrastructures at the community level for the delivery of health services and other needed ancillary services to individuals in the community by improving the service capacity of health care service providers.

Technical Assistance (TA) - The process of providing recipients with expert assistance of specific health related or administrative services that include; systems review planning, policy options analysis, coordination coalition building/training, data system development, needs assessment, performance indicators, health care reform wrap around services, CSHCN program development/evaluation, public health managed care quality standards development, public and private interagency integration, and identification of core public health issues.

Title XIX, number of infants entitled to - The unduplicated count of infants who were eligible for the State's Title XIX (MEDICAID) program at any time during the reporting period.

Title XIX, number of pregnant women entitled to - The number of pregnant women who delivered during the reporting period who were eligible for the State's Title XIX (MEDICAID) program

Title V, number of deliveries to pregnant women served under - Unduplicated number of deliveries to pregnant women who were provided prenatal, delivery, or post-partum services through the Title V program during the reporting period.

Title V, number of infants enrolled under - The unduplicated count of infants provided a direct service by the State's Title V program during the reporting period.

Total MCH Funding - All the MCH funds administered by a State MCH program which is made up of the sum of the *Federal* Title V Block Grant allocation, the *Applicant's* funds (carryover from the previous year's MCH Block Grant allocation - the unobligated balance), the *State* funds (the total matching funds for the Title V allocation - match and overmatch), *Local* funds (total of MCH dedicated funds from local jurisdictions within the State), *Other* Federal funds (monies other than the Title V Block Grant that are under the control of the person responsible for administration of the Title V program), and *Program Income* (those collected by State MCH agencies from insurance payments, MEDICAID, HMO's, etc.).

Types of Services - The major kinds or levels of health care services covered under Title V activities. See individual definitions under "Infrastructure Building," "Population Based Services," "Enabling Services," and "Direct Medical Services."

5.2 Assurances and Certifications

ASSURANCES -- NON-CONSTRUCTION PROGRAMS

Note: Certain of these assurances may not be applicable to your project or program. If you have any questions, please contact the Awarding Agency. Further, certain Federal assistance awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant I certify that the applicant:

1. Has the legal authority to apply for Federal assistance, and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project costs) to ensure proper planning, management and completion of the project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States, and if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the assistance; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will establish safeguards to prohibit employees from using their position for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. Sects. 4728-2763) relating to prescribed standards for merit systems for programs funded under one of the nineteen statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
6. Will comply with all Federal statutes relating to non-discrimination. These include but are not limited to (a) Title VI of the Civil Rights Act of 1964 (P.L. 88 Sect. 352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. Sects. 1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; © Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. Sect. 794), which prohibits discrimination on the basis of handicaps; (d) The Age Discrimination Act of 1975, as amended (42 U.S.C. Sects 6101 6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office of Treatment Act of 1972 (P.L. 92-255), as amended, relating to non-discrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment, and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to non-discrimination on the basis of alcohol abuse or alcoholism; (g) Sects. 523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. Sect. 3601 et seq.), as amended, relating to non-discrimination in the sale, rental, or financing of housing; (I) any other non-discrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and (j) the requirements of any other non-discrimination statute(s) which may apply to the application.
7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

8. Will comply with the provisions of the Hatch Act (5 U.S.C. Sects 1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.
9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. Sects. 276a to 276a-7), the Copeland Act (40 U.S.C. Sect 276c and 18 U.S.C. Sect. 874), the Contract Work Hours and Safety Standards Act (40 U.S.C. Sects. 327-333), regarding labor standards for federally assisted construction subagreements.
10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in flood plains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. Sects. 1451 et seq.); (f) conformity of Federal actions to State (Clear Air) Implementation Plans under Section 176 of the Clear Air Act of 1955, as amended (42 U.S.C. 7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. Sects 1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers systems
13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. Sect. 470), EO 11593 (identification and preservation of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. Sects. 469a-1 et seq.)
14. Will comply with P.L.93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.
15. Will comply with Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. Sects. 2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by the award of assistance.
16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. Sects. 4801 et seq.) which prohibits the use of lead based paint in construction or rehabilitation of residence structures.
17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act of 1984.
18. Will comply will all applicable requirements of all other Federal laws, executive orders, regulations and policies governing this program.

CERTIFICATIONS

1. CERTIFICATION REGARDING DEBARMENT AND SUSPENSION

By signing and submitting this proposal, the applicant, defined as the primary participant in accordance with 45 CFR Part 76, certifies to the best of its knowledge and belief that it and its principals:

- (a) are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal Department or agency;
- (b) have not within a 3-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission or fraud or criminal judgment in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- © are not presently indicted or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission or any of the offenses enumerated in paragraph (b) of the certification; and
- (d) have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

Should the applicant not be able to provide this certification, an explanation as to why should be placed after the assurances page in the application package.

The applicant agrees by submitting this proposal that it will include, without modification, the clause, titled "Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion -- Lower Tier Covered Transactions" in all lower tier covered transactions (i.e. transactions with sub-grantees and/or contractors) in all solicitations for lower tier covered transactions in accordance with 45 CFR Part 76.

2. CERTIFICATION REGARDING DRUG-FREE WORKPLACE REQUIREMENTS

The undersigned (authorized official signing for applicant organization) certifies that the applicant will, or will continue to, provide a drug-free workplace in accordance with 45 CFR Part 76 by:

- (a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;
- (b) Establishing an ongoing drug-free awareness program to inform employees about-
 - (1) The dangers of drug abuse in the workplace;
 - (2) The grantee's policy of maintaining a drug-free workplace,
 - (3) Any available drug counseling, rehabilitation, and employee assistance programs; and
 - (4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;
- © Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a) above;
- (d) Notifying the employee in the statement required by paragraph (a) above, that, as a condition of employment under the grant, the employee will-
 - (1) Abide by the terms of the statement; and
 - (2) Notify the employer in writing of his or her conviction for violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;

- (e) Notify the agency in writing within ten calendar days after receiving notice under paragraph (d)(2) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer or other designee on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant;
- (f) Taking one of the following actions, within 30 calendar days of receiving notice under paragraph (d)(2), with respect to any employee who is so convicted-
 - (1) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended, or
 - (2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;
- (g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (a), (b), (c), (d), (e), and (f).

For purposes of paragraph (e) regarding agency notification of criminal drug convictions, the DHHS has designated the following central point for receipt of such notices:

Division of Grants Policy and Oversight
 Office of Management and Acquisition
 Department of Health and Human Services
 Room 517-D
 200 Independence Avenue, S.W.
 Washington, D.C. 20201

3. CERTIFICATION REGARDING LOBBYING

Title 31, United States Code, Section 1352, entitled "Limitation on use of appropriated funds to influence certain Federal contracting and financial transactions," generally prohibits recipients of Federal grants and cooperative agreements from using Federal (appropriated) funds for lobbying the Executive or Legislative Branches of the Federal Government in connection with a SPECIFIC grant or cooperative agreement. Section 1352 also requires that each person who requests or receives a Federal grant or cooperative agreement must disclose lobbying undertaken with non-Federal (non-appropriated) funds. The requirements apply to grants and cooperative agreements EXCEEDING \$100,000 in total costs (45 CFR Part 93).

The undersigned (authorized official signing for the applicant organization) certifies, to the best of his or her knowledge and belief that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federally appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an

officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions. (If needed, Standard Form-LLL, "Disclosure of Lobbying Activities," its instructions, and continuation sheet are included at the end of this application form.)

- (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

4. CERTIFICATION REGARDING PROGRAM FRAUD CIVIL REMEDIES ACT (PFCRA)

The undersigned (authorized official signing for the applicant organization) certifies that the statements herein are true, complete, and accurate to the best of his or her knowledge, and that he or she is aware that any false, fictitious, or fraudulent statements or claims may subject him or her to criminal, civil, or administrative penalties.

The undersigned agrees that the applicant organization will comply with the Public Health Service terms and conditions of award if a grant is awarded as a result of this application.

5. CERTIFICATION REGARDING ENVIRONMENTAL TOBACCO SMOKE

Public Law 103-227, also known as the Pro-Children Act of 1994 (Act), requires that smoking not be permitted in any portion of any indoor facility owned or leased or contracted for by an entity and used routinely or regularly for the provision of health, day care, early childhood development services, education or library services to children under the age of 18 if the services are funded by Federal programs either directly or through State or local governments by Federal grant, contract, loan, or loan guarantee. The law also applies to children's services that are provided in indoor facilities that are constructed, operated, or maintained with such Federal funds. The law does not apply to children's services provided in private residences; portions of facilities used for inpatient drug or alcohol treatment; service providers whose sole source of applicable Federal funds is Medicare or Medicaid; or facilities where WIC coupons are redeemed. Failure to comply with the provisions of the law may result in the imposition of a monetary penalty of up to \$1,000 for each violation and/or the imposition of an administrative compliance order on the responsible entity.

By signing this certification, the undersigned certifies that the applicant organization will comply with the requirements of the Act and will not allow smoking within any portion of any indoor facility used for the provision of services for children as defined by the Act.

The applicant organization agrees that it will require that the language of this certification be included in any subawards which contain provisions for children's services and that all subrecipients shall certify accordingly. The Public Health Service strongly encourages all grant recipients to provide a smoke free workplace and promote the non-use of tobacco products. This is consistent with the PHS mission to protect and advance the physical and mental health of American people.

5.3 Other Supporting Documents

Advisory Council on Adolescent Health Members, 2000

<u>Name</u>	<u>Affiliation</u>
Lisa Abrams	West High School
Martha Aguilar	Planned Parenthood of the Rocky Mountains
Krista Anderson	Planned Parenthood of the Rocky Mountains
Louise Bauer	National Conference of State Legislatures
John Befus	Unaffiliated
Barbara Bennett-Rivera	MiCasa Resource Center for Women
Sandra Berkowitz	Kaiser Permanente
Beverly Buck	Univ. of Colorado at Denver Graduate School of Public Affairs
Karen Connell	Colorado Department of Education
Karen Connor	State School Nurse Consultant, CDPHE*
Sondra Cook	Colorado Department of Human Services
Carol Cowley	New Horizons Adolescent Clinic
Karen DeLeeuw	Colorado Tobacco Use Reduction Program, CDPHE*
Mary Doyen	Rocky Mountain Center for Health Promotion
Susan Dreisbach	Univ. of Colorado at Denver
Monyett Ellington	Child, Adol. and School Health Section, CDPHE*
Kris Gonzalez	Channel 9 TV
Bruce Guernsey	Colorado School-Based Health Center Initiative, CDPHE*
Susan Hagedorn	Univ. of Colorado Health Sciences Center
Cheryl Haggstrom	LMC Community Foundation
Sandy Hoops	Barbara Davis Diabetes Center
Jill Hunsaker	CDPHE*
Charles Jenkins	Unaffiliated
Stephanie Johnson	Arapahoe House
Terri Pankey	Arapahoe House
Jerene Petersen	Urban Peak
Timothy Reardon	FACHE
Kathy Reiner	Colorado Association of School Nurses
Katie Reinisch	Planned Parenthood of the Rocky Mountains
Barbara Ritchen	Director, Child, Adol. and School Health Section, CDPHE*
Ronnie Rosenbaum	Shared Beginnings, St. Anthony Centura
Michael Rudnick	Westside Teen Clinic, Denver Health and Hospitals
Dorothy Rupert	State Legislator, Boulder County
Desere Sanchez	LARASA
Judy Shlay	Denver Public Health
Eric Sigel	The Children's Hospital
Dave Stalls	The Spot
Merril Stern	Director, Family & Comm. Health Services Division, CDPHE*
Wendy Stoudt	Unaffiliated
Kellie Teter	Women's Health Section, CDPHE*
Elena Thomas	Colorado Community Health Network
Ann Terrill-Torrez	Denver Health
Annie VanDusen	Rose Community Foundation
Leah Varnell	Planned Parenthood
David Wells, MD	Division of Youth Corrections, Colo. Dept. of Human Services
Roxanne White	Urban Peak
Meg Williams	Division of Child Welfare Svcs., Colo. Dept. of Human Services
Sue Williamson	EPSDT, CDPHE*
Larry Wolk	Prudential Healthcare
Nicky Wolman	Adams County School District 12

* Colorado Department of Public Health & Environment

**Advisory Council on Health Programs for Women and Children
2000 Voting Membership**

<u>Name</u>	<u>Affiliation</u>
Jackie Brown	Public Health Nursing Association of Colorado
Darci Cherry	Health Statistics Division, Colorado Dept. of Public Health & Environment
Dorine Day	Colorado Medical Society
Tisha Dowe	Colorado Health Officers Association
Jan Goldberg	Colorado Perinatal Care Council
Carolyn Harris	Consumer Member
Tom Heimlich	Colorado Department of Health Care Policy and Financing
Annette Kowal	Colorado Community Health Network
Lucy Loomis	Colorado Academy of Family Practice Physicians
John Miles	Colorado Department of Human Services
Paula Pierce	Interagency Nutrition Committee
Sally Rausch	Consumer Member
Donald Schiff	Colorado Chapter, American Academy of Pediatrics
Bobbi Siegel	At-Large Member
Averil Strand	Colorado Health Department Nursing Directors
Mary VanderWall	Colorado Department of Education
David Wells	Advisory Council on Adolescent Health

Care Coordination for Children with Special Health Care Needs Enrolled in CHP+ or Medicaid

**A Public Health Model
Offered by Essential Community Providers**



Colorado Department
of Public Health
and Environment

**Health Care Program for Children with Special Needs (HCP)
Colorado Department of Public Health and Environment
Contact: Kathy Watters, 303-692-2418**

March 2000



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INTRODUCTION

Care Coordination for Children with Special Health Care Needs is offered through 13 regional and 45 local public health agencies that serve all 63 counties in Colorado. The agencies are supported by the Colorado Department of Public Health & Environment's Health Care Program for Children with Special Needs (HCP).

Care Coordination is implemented by professionals and para-professionals from many disciplines who are trained to assess a full range of pediatric health care needs. Staff includes community health nurses, registered dietitians, speech pathologists, occupational/physical therapists, hearing specialists, audiologists, and social workers as well as family consultants, resource specialists, and outreach workers. For each family who enters care coordination, the Primary Care Provider is notified and a Care Coordinator from the appropriate discipline is assigned. After initial assessment, a team is identified which includes the parent(s) and those staff members who can address the child and family's specific needs.

Definition:

Care coordination is the process of developing and implementing an integrated plan of action with each family, in cooperation with the Primary Care Provider, ensuring access to needed services and resulting in improved health and quality of life.

The Intent of Care Coordination is to:

- Maintain or improve the health and well being of children.
- Reduce emergency room visits.
- Prevent duplication of costly treatment.
- Prevent treatment delays.
- Increase the family's understanding of recommended treatments.
- Increase patient and provider satisfaction.
- Augment the support of families by utilizing community resources.
- Ensure long-range comprehensive planning.
- Create independent families.
- Encourage families to maintain continuous health care coverage for primary and specialty medical services.
- Improve communication across service and support agencies, professionals, volunteers, and families.

Essential Activities of Care Coordination:

C Communication/Trust Building

Identifying and supporting family strengths, culture and values.

C Assessment

Collecting and reviewing medical and educational records, and identifying strengths, needs, and available resources in concert with the family and providers.

C Planning

Assisting the family in determining specific objectives, goals, and actions designed to meet identified needs. The care plan is action oriented and time-specific.

C Implementation

Executing specific activities and/or interventions that will lead to accomplishing the goals set forth in the care plan. This involves organizing, securing, integrating, and modifying the resources necessary to accomplish the goals.

C Monitoring and Evaluation

Gathering ongoing information from all relevant sources about the care plan and its activities and/or services to enable the Care Coordinator and family to determine the care plan's effectiveness in reaching desired outcomes and goals. This might lead to a change in the care plan in its entirety or any of its component parts.

Essential Activities are Delivered Through:

- Office Consultations
- Home Visits
- Team Conferences
- Telephone Calls

Protocol:

Step 1:

The Colorado Department of Public Health and Environment, HCP office receives a referral on a child with potential special health care needs. Sources of referrals include regional and local public health agencies, HMOs, health care providers, and CHP+ staff who process the 'Application for Health Care for Colorado Children. This application includes a question intended to identify children with special health care needs. The HCP Office logs the referrals and forwards it to the appropriate regional office for verification that the applicant meets the definition of a child with special health care needs. **(See Attachment I)**

Step 2:

If the child meets the definition attention is given to determining if there are immediate needs. A family interview is requested and consent to proceed with care coordination is obtained. A Care Coordination Acuity Tool is completed to determine whether the situation is of low, moderate or high complexity and which members of the HCP Care Coordination Team will be involved. **(See Attachment II)** With parent permission, copies are forwarded to the Primary Care Provider, the HMO, and the HCP Office. This process of assessment may require more than one contact.

Step 3:

The HCP Care Coordinator is assigned and provides assistance to meet immediate needs. If the case is designated as low complexity, the HCP Care Coordinator assumes a monitoring role and no formal plan is initiated.

Step 4:

If the case is moderate or high complexity, the HCP Care Coordinator, in consultation with the multi disciplinary team, completes the Child and Family Care Plan **(See Attachment III)** with the family. The HCP Care

Coordinator and family discuss the planning process and the need to document the plan. Activities are discussed which will meet the identified needs with assignments and time lines.

Step 5:

Therefore, the family and the HCP Care Coordinator may decide to convene a conference to complete the Child and Family Care Plan. It is important for the HCP multi disciplinary team to effectively integrate all other community agencies and systems, e.g., Education, Mental Health, and Child Protection. The HCP Care Coordinator explains options and supports the parents' choices. With parent permission, a copy of the Care Plan is forwarded to the Primary Care Provider, the HMO, and the HCP Office.

Step 6:

The HCP Care Coordinator assists the family with implementation of the Care Plan. This may involve helping families make and keep appointments, and ensuring these services meet the family's needs. Simultaneously, the HCP Care Coordinator and other members of the multi disciplinary team will promote self-sufficiency in the family by providing education and training.

Step 7:

The HCP Care Coordinator and the multi disciplinary team will monitor progress on the Care Plan in conjunction with the Primary Care Provider, the HMO, and other professionals involved with the family. This may involve revising or re-writing the Care Plan. The HCP Care Coordinator conducts an evaluation with the family annually to assure the family is satisfied with the Care Plan and activities. With parent permission, an Annual Report (**See Attachment IV**) is written and copies are sent to the Primary Care Provider, the HMO, and the HCP Office.

Package Pricing for One Year of Care Coordination Based Upon Prices for Essential Activities on Following Page

Prices are not intended to cover the entire cost of providing the service.

families w/needs of low complexity

1 extensive consultation	=	\$ 70.00
1 limited consultation	=	\$ 40.00
4 limited phone calls	=	<u>\$ 28.00</u>
		\$138.00 }

families w/needs of moderate complexity

1 extensive consultation	=	\$ 70.00
1 moderate home visit	=	\$ 75.00
1 hr./3 person team conference	=	\$105.00
2 moderate phone calls	=	\$ 28.00
3 limited phone calls	=	<u>\$ 21.00</u>
		\$299.00 } }

families w/needs of high complexity

1 extensive consultation	=	\$ 70.00
1 extensive home visit	=	\$ 90.00
2 moderate home visits	=	\$150.00
1 moderate consultations	=	\$ 55.00
1 hr./4 person team conference	=	\$140.00
2 extensive phone calls	=	\$ 42.00
2 moderate phone calls	=	\$ 28.00
3 limited phone calls	=	<u>\$ 21.00</u>
		\$596.00 } }

} Includes completion of Care Coordination Acuity Tool and Annual Report

}} Includes completion of Care Coordination Acuity Tool, Child and Family Care Plan, and Annual Report

Prices:

<u>Consultations</u>	limited (30) minutes or less)	=	\$ 40.00
	moderate (31 to 60 minutes)	=	\$ 55.00
	extensive (61 + minutes)	=	\$ 70.00
<u>Home Visits</u>	limited (45 minutes or less)	=	\$ 60.00
	moderate (46 to 75 minutes)	=	\$ 75.00
	extensive (76 + minutes)	=	\$ 90.00
<u>Team Conferences</u>	/professional/hour	=	\$ 35.00
<u>Telephone calls</u>	limited (10 min. or less)	=	\$ 7.00
	moderate (11 to 20 min.)	=	\$ 14.00
	extensive (21 min. or more)	=	\$ 21.00

REFERENCES

Case Management for Mothers and Children, National Maternal and Child Health Resource Center, Association of Maternal and Child Health Programs, Annual Meeting, May 22, 1988.

Children with Special Health Care Needs in Managed Care Organizations: Definitions and Identification Family Participation, Capitation and Risk Adjustment, Quality of Care, Division of Services for Children with Special Needs, Maternal and Child Health Bureau, December, 1996.

Colorado Department of Public Health and Environment, Women's Health Section, Colorado Department of Health Care Policy and Financing, Health Plans and Medical Services, Prenatal Plus Provider Manual, 2/16/96.

"Definitions of Care Coordination and Case Management," Title V Social Security Act.

Eden, Joan, M.S.P.H., R.D., Care Coordination, 1997.

Enhanced Care for High Risk Individuals, Maryland contract between CSHCN and Medicaid, Attachment 1.E, 1/24/96.

Hamilton, Haynes, Todd, Gomez, Horne, Feldman, Johnson, Knaack, Slay, Care Coordination Training and Resource Compendium, Spring, 1998.

Hays, Beverly J., Nursing Intensity as a Predictor of Resource Consumption in Public Health Nursing, Nursing Research, Mar/April, 1995.

McAteer, Patsy, R.N., M.S.N. and Sue Dabiri, 'Care Coordination Guidelines," January 29, 1997.

Miller, Jerri and Sandy Petersen, "Colorado Guidelines for Service Coordination," Early Childhood Connections (Part C)

□A New definition of Children With Special Health Care Needs, Pediatrics, Vol. 102, No. 1, July 1998.

Renken, Catherine A., RN, MPH, Director and Judith Wickman, RN, B.S.N., Nurse Consultant, "CaCoon--CAre COordinatiON," CaCoon Program Manual

Skilled Professional Assessment, Care Planning and Coordination Activities (Enhanced), □ Seattle/King County Cooperative Agreement with Washington State Social Services,.

SSDI-Ciss-news: PIC Alert, July, 1998.

"Standards for Social Work," , National Association of Social Workers (NASW), June 1992.

Trierweiler, Karen, C.N.M., M.S., Jane Cotler, R.N., M.S., C.S.N., Jan McNally, R.N., M.S., An Introduction to Home Visitation, Colorado Department of Public Health and Environment, March, 1996.

University of Kentucky College of Nursing, National Standards of Nursing Practice for Early Intervention Services, July 1993.

Attachment I

HEALTH CARE PROGRAM FOR CHILDREN WITH SPECIAL NEEDS (HCP) THE HCP DEFINITION OF A CHILD WITH SPECIAL HEALTH CARE NEEDS

For financial assistance and care coordination services, HCP has adopted a limited definition of children with special health care needs, because of limited personnel and resources. This definition is as follows:

Any child who is a Colorado resident under the age of 21 years, who has one of the following conditions or is in need of assistance in obtaining health care and related services:

- congenital heart disease
- orthopedic conditions
- neurological conditions
- hearing loss and ear pathology
- eye conditions
- cleft lip and palate
- cystic fibrosis
- bladder and kidney conditions
- stomach and intestinal conditions
- orthodontia services
- rehabilitation, habilitation
- medical equipment and hearing aids

HCP does not typically serve children with cancer, mental retardation, asthma, diabetes, hemophilia, mental, emotional, behavioral disorders. However, children should be referred to the program if they have these conditions and if they can benefit from the care coordination services. HCP may serve them based on available personnel and resources.

NOTE: See HCP Handbook for additional information

Today's Date: _____

Date of 30 Day Review: _____

ADDITIONAL NEEDS IDENTIFIED

BY FAMILY

BY PROFESSIONAL

• Child: _____

• Family: _____

MEDICAL REFERRALS (if child is enrolled in an HMO, referral must be obtained from the Primary Care Provider)

- Therapy (type) _____
- EPSDT _____
- Primary Care _____
- Specialty Care (type) _____

- Prenatal Care _____
- Mental Health _____
- HCP Clinic _____

COMMUNITY REFERRALS

- Medicaid
- Medicaid Waivers
- CHP+
- ARC
- CROP
- Vocational Rehab
- SSI
- BOCES

- Child Find
- CCB
- Parent Support Network
- Human Services
- Employment
- Housing
- Food Resources
- Transportation

- Legal
- Advocacy
- Child Care
- Respite
- Head Start
- CoHear
- WIC
- Family Planning

NOTES

Parent/Guardian gave verbal permission to send the above information to:

Initials: _____ Date: _____
Revocation Date: _____

Attachment III

**HEALTH CARE PROGRAM FOR CHILDREN WITH SPECIAL NEEDS (HCP)
CARE COORDINATION
CHILD & FAMILY CARE PLAN**

Date: _____ Child's ID:
Child's Name: _____ Child's DOB
Referral Date:
Care Coordination Team:
Next Care Coordination Plan Date:
Next Child and Family Service Plan Date:
Case Closed Date: _____ Case Reopened Date:

CARE COORDINATION COMPLEXITY LEVEL: Low, Moderate, High
Service Planned: Services Received:

PROGRAM PRESUMPTIVE ELIGIBILITY:
Financial Programs Diagnostic Programs Financial/Diagnostic Programs

CONTACTS SUMMARY:
Care Coordinator Contact: (Name, #, Time Spent) **Contact Initiator:** (#)
Care Coordinator
Family
Provider

Contact Place Summary: (Topic and Time Spent) **Contact Type Summary:** (# and Time Spent)
Telephone Call
Home Visit
Consultation
Unsuccessful Attempts
Family Consultation
Provider Consultation
Supplies/Materials Provided
Special Forms/Reports Completed
Education/Training Provided
Team Conference

Contact Topic Summary: (Topic and Time Spent)

SERVICES SUMMARY: (Topic/Date)
Need Referred Received

Team Comments:

Child's Name _____

DOB

Child and Family Service Plan

Service Category

Service Topic

Service Recipient:

Date Need Identified:

Date Referred:

First Date Received:

Service Amount Received:

Provider Name/Title:

Provider System:

Provider Address/Phone:

Funding Source:

Comments:

Service Category

Service Topic

Service Recipient:

Date Need Identified:

Date Referred:

First Date Received:

Service Amount Received:

Provider Name/Title:

Provider System:

Provider Address/Phone:

Funding Source:

Comments:

Parent/Guardian gave verbal permission to send the above information to:

Initials: _____ Date:

Revocation Date:

Attachment IV

HEALTH CARE PROGRAM FOR CHILDREN WITH SPECIAL NEEDS (HCP) CARE COORDINATION ANNUAL REPORT

Date:

Child's Name: _____ Child's D.O.B.

Referral Date:

Care Coordination Team:

Care Coordination Complexity Level: *low, moderate, high*

Summary of Services Needed/Planned:

Summary of Services Received:

Care Coordinator and Family evaluation of Care Coordination plan and results:

General or Specific Outcomes:

Recommendations:

Signatures: _____ Date _____ Date

Signatures: _____ Date _____ Date

Parent/Guardian gave verbal permission to send the above information to:

Initials: _____ Date: _____
Revocation Date: _____

Colorado Child Care Assessment: Need for Nurse Consultation Services 1999

This evaluation was conducted by:

Susan Grimm MSPH
Evaluation Consultant
Custom Measure
(303) 388-9528



with assistance from:

- Dean Mc Ewen, MS
in quantitative data analysis and graphical displays

I would also like to personally thank all the childcare providers who thoughtfully completed and returned the assessment.

Funding for this effort was provided by the Health Systems Development in Child Care Grant, #IMCJ-08-KCC-8-02. For further project information please contact:

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COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

EXECUTIVE SUMMARY: COLORADO CHILD CARE ASSESSMENT

In an effort to determine current practice as well as future needs, an assessment of nurse consultation services in 1,154 child care centers in Colorado was conducted by the Colorado Department of Public Health and Environment in April 1999, as part of the Healthy Child Care Colorado grant. Contacts were made by the grant evaluator with public health nurses throughout the state and their input was utilized in designing the assessment tool.

Surveys were returned by 38% of the child care centers. Results of the assessment were organized into six broad categories. They are as follows:

Children and Staffing:

- Most children in both rural and urban centers are preschool children
- The average number of children enrolled in urban sites ranged from 21 per day ... between 21 and 40; rural sites generally fewer than 20
- The most common child care worker is a permanent part-time employee
- Centers employ one to 10 permanent, part-time staff.

Need for Nurse Health Care Services:

- Forty-three percent of all responses indicated that care of sick children, safety in general, and nutrition were prime needs
- Also considered very important were immunizations, communicable diseases, screenings, staff physicals, child behavior issues, and parent education
- The number one request for nurse health care services was for the provision of child health care on site. Advice, information and training regarding these issues ranked next in importance
- Sick care continues to be a critical area of concern with almost no center having solutions to this problem.

Need for Nursing Consultation Services:

- The second most requested need for nursing services was for advice, information and consultation
- Four areas received top priority: advise regarding special needs children, development of guidelines for sick children, development of infectious disease protocols, and phone consultation for sick children
- Other areas rated slightly below included referrals to health care providers, OSHA compliance, advise on safety and playground equipment, and licensing compliance.
- Consultation and advice on special needs children included such concerns as speech and language problems, ADD/ADHD, cerebral palsy, and behavioral/learning disabilities
- Greater than 1/3 of centers reported one to five special needs children in their care.
- The average number of special needs children is three.

Staff Training Needs:

- Staff training was the third most frequently requested type of nursing consultation service
- Topics covered in order of percentage of staff trained, included universal precautions, policies and procedures, communicable diseases, injury prevention, child abuse/neglect, nutrition, fever management, and identifying sick children
- Training was generally on-site followed in frequency by a childcare conference, local resources and referral agencies, and local colleges
- Although advice on infection control, special needs children, and the identification of sick children were high priorities for nursing consultation, they were of medium priority for staff training. Perhaps these are topics in which childcare staff would rather defer to the expertise of a nurse rather than develop their own expertise in these areas
- Training with regard to behavior and discipline was given the highest priority of all other health-related topics.

Need for Child and Family Services:

The following requests were given a high priority by providers:

- parent information on when to keep a sick child home
- parent information on when to take a sick child to the doctor
- parenting classes
- television watching guidelines for parents.

Current Nurse Child Care Consultant Utilization:

- More than three fourths of the providers who responded to this question said they used a nurse consultant at least once in the last twelve months
- Approximately 2% of respondents employ their own nurse consultant
- Nearly half (49%) of urban centers reported using a nurse consultant six or more times over the past year compared to 32% of rural centers
- The majority of respondents reported paying or anticipated paying \$25 to \$50 per month. Hourly rates ranged from \$25 to \$40/hour
- Nurses interviewed as part of the survey preparation, cited a pressing need for a nurse partnership with child care center providers
- According to nurses, many child care center staff need more education in sick child triage, nutrition and feeding, playground safety, child abuse/neglect, infection control and other areas
- Most nurses prefer to deliver education on-site giving them a presence at the center to develop skill building and observe application of training.

Summary and Conclusion:

Nurses and childcare providers concur that nurses have a role in the health and safety of children in child care centers. Beyond the traditional health functions nurses have provided, they can help centers by providing training, skill building, and support to child care center staff.

If you have any questions concerning this assessment, please call Jane Cotler at (303) 692-2352 or Kathy Brunner at (303) 692-2335.

August 1999

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Background

With over sixty percent of Colorado families with children under the age of six in the work force, the childcare setting occupies a major position in the health, safety, and well being of Colorado's children. It is not unusual for childcare professionals to be confronted on a daily basis with any one of a number of health or safety issues regarding the children in their care.

Not only must providers address the myriad of childhood illnesses from pink eye to the common cold, they must also provide a safe and injury free environment, comply with immunization guidelines and OSHA regulations, provide proper nutrition, detect signs of abuse and neglect, confront behavioral and disciplinary issues, and care for children with special needs. Very few childcare centers are equipped with health care professionals who have expertise in these areas. Those that do not have expertise on site can benefit from consultation with a trained professional.

Recognizing the need for a more comprehensive approach to the integration of health and safety services in the childcare setting, the Healthy Child Care America Campaign was implemented. This initiative is a partnership between the American

An average of six to ten hours of nurse consultation [is] associated with improved performance in health and safety in [childcare] centers.

Academy of Pediatrics, the Maternal and Child Health Bureau, the U.S. Department of Health and Human Services and state health departments. The campaign's focus is the development by communities of health, safety, and

support systems for local childcare settings. As part of the campaign, a Blueprint for Action for Health and Safety was developed that highlights the importance of nurse consultation services for childcare centers.

In their ever-evolving multifaceted roles, public health nurses have become recognized as experts in child health and development as well as in community health. These combined competencies position public health nurses as ideally suited to work with childcare providers and the children and families they care for. Dr. Susan Aronson, in a 1990-92 study, demonstrated that an average of six to ten hours a year of nurse consultation was associated with improved performance in health and safety in centers.

The public health nurse consultant can provide guidance and technical assistance to childcare providers regarding the health and safety of children in their care. The consultant may provide phone consultation regarding sick children or on-site health supervision of children. Consultant activities may also include staff training, parent and child health education programs, assessment of health and safety practices, referral to other health professionals, staff physicals, review and development of policies and procedures, and maintenance of health records. Within the context of direct service provision and consultative support, the public health nurse can assure that:

- the childcare setting is a safe and healthful place to care for children
- childcare children and their families are linked to primary care providers
- childcare staff have adequate and appropriate health and safety training
- childcare centers comply with local, state, and federal regulations
- childcare families are linked with health and social and educational programs as needed
- quality nutrition is provided for children while in the care of center staff
- special needs children are identified, assessed and referred
- immunization and health records are maintained
- policies and procedures are in place and adhered to in order to maximize quality.

Rationale

Consistent with Healthy Child Care America Campaign's Blueprint for Action, a statewide assessment of childcare providers throughout Colorado was conducted during the summer of 1999. The intent of the assessment was to identify the specific needs of childcare providers with regard to nurse consultation services. Nurse childcare experts throughout the state were consulted regarding the conceptualization and design of the assessment

Local public health nurses are already called upon by many of their provider constituents to provide consultative services. They know that many others need and want their help. In order to target their efforts and ensure that all public health nurses are properly trained to respond to requests for advice and service, it is important to ask providers to define and prioritize their health and safety needs. The assessment information presented in this report can be used to design locally responsive systems throughout the state in which nurses can effectively partner with childcare providers in providing optimum health care services, training, administrative and referral services to childcare providers and their staff and families.

Methodology

An external program evaluator, in collaboration with program directors and selected public health nurses statewide, designed a two-page assessment tool. The assessment tool was distributed to all 1154 licensed childcare centers in Colorado. Childcare homes were not surveyed. Included with the tool was a letter of explanation asking providers to complete and return the survey in the enclosed stamped and addressed return envelope. As an incentive to complete and return the assessment, a ticket for a drawing for one of eight \$25 food vouchers was also included. Completed assessments were mailed directly to the external evaluator who separated tickets and delivered them to program centers who conducted the drawing. Anonymity was guaranteed to all participants.

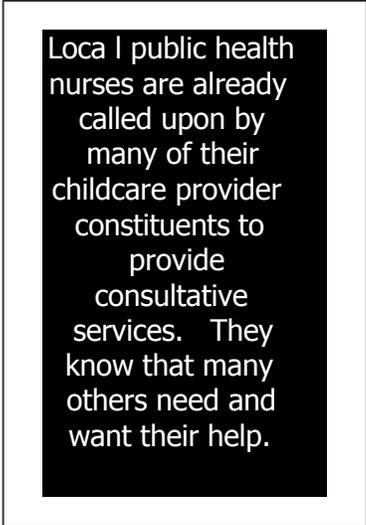
Prior to mailing the instrument, questions were converted to scannable format using Teleform software by Cardiff. Respondents were asked to completely fill in the circles of the answers they chose. Forms were scanned and verified using the software. Responses to close-ended questions were analyzed with Microsoft Access. Open-ended responses were entered into a Microsoft Excel database where they were coded and grouped thematically.

Of the 1154 Assessments sent, 74 were returned for wrong address or No Longer at This Address. Of the remaining 1080, 411 were returned by the deadline for an overall return rate 38 percent. This higher than average return for a mail out assessment is at least partially attributable to the incentive offered for its return.

In deference to anonymity, postmark or return address determined the geographic location from which completed assessments

were obtained. Of the 411 completed returns, 347 or 84 percent came from urban areas including Denver Metro and Colorado Springs. Forty (10%) came from rural areas including Alamosa, Aspen, Durango, Glenwood Springs, Golden, Grand Junction, Greeley, La Jara, La Salle, Loveland, Minturn, Oak Creek, Olathe, Parachute, Rifle, Security, Steamboat, Salida, Sterling, and Woody Creek. For 24 assessments (6%), no geographic identification was possible. The urban return rate was 39 percent (347/896), the rural return rate, 22 percent (40/184).

In addition to the provider assessment, five public health nurses from rural and urban communities were interviewed with respect to the need for childcare consultative services. These nurses described the childcare consultation in which they



Local public health nurses are already called upon by many of their childcare provider constituents to provide consultative services. They know that many others need and want their help.

were already engaged and the need for additional services. They further elaborated on the value of relationship building with providers. Their perspectives are included in the segment of the report that describes current nurse childcare consultation utilization.

Results of the assessment are summarized in graphical displays on the subsequent pages of this report. Data have been stratified into rural and urban sub-categories for most data displays. Actual specific data tables are available upon request. Included in the Appendix is a copy of the assessment tool.

Findings

The actual findings of this evaluation are organized into six broad categories:

- Children and Staffing
- Need for Nurse Health Care Services
- Need for Nurse Consultation services
- Need for Family and Child Services
- Staff Training Needs
- Nurse Childcare Consultant Utilization

Children And Staffing

The childcare centers represented in this study care for infants through school age children. Most of the children in both rural and urban centers are pre-school age children. Centers in urban areas care for, on average, 21 to 40 preschoolers per day whereas rural sites generally have enrollments of less than 20 on average.

Toddlers comprise an average of 11 percent of the childcare population and infants, 6 percent despite their location. Those who care for infants generally have no more than 10 in their care on any one day, toddlers less than 20. Table 1. displays the relative distribution of children among rural and urban participant locations.

Table 1. Distribution of Children among Centers by Age Group

Age Group	Rural	Urban	All
Infants	6%	6%	6%
Toddlers	9%	11%	11%
Pre-school	48%	51%	51%
School Age	37%	32%	32%

Most frequent staffing categories among participant sites are consistent despite location.

The most common childcare worker is a permanent part-time employee.

Centers employ 1 to 10 permanent part-time staff on average. The next most frequent staff classification is that of permanent full-time employee.

Smaller and rural centers employ 1 to 10 permanent full-time employees on average; larger urban centers average 11 to 20.

Temporary employees are not common among

the childcare centers that responded to this study.

Most of the children enrolled in both urban and rural centers are pre-school age children.

The most common childcare worker is a permanent part-time employee.

Need for Nurse Health Care Services

To better frame the need for nurse services, providers were asked to list the top three health and safety needs of the children in their care. Forty-three percent of all responses indicated that care of sick children, safety in general, and nutrition were prime needs. Next in importance

regarding health and safety of children were immunizations and communicable diseases followed by screenings, staff physicals, child behavior issues, and parent education. A complete prioritization is found in Figure 1. High priority needs are displayed in large fonts; lower priority needs in smaller fonts.

Figure 1. Childcare Provider Top Health and Safety Needs

Health/Safety Needs	
Care of Sick Children	
Safety	
Nutrition	
Immunizations	
Communicable Diseases	
Screenings	Child Behavior
Staff training	Parent Education
Abuse	Well Child Checks
Physicals	Dental Health
Hygiene	Cleanliness
Health/Healthcare	Medication Administration

When childcare providers were asked to tell us in their own words in what way a local public health nurse consultant could be of most help to them, their staff and the children and families they serve, 99 percent wrote in some response. A summary of their responses is displayed in Figure 2.

The number one request for nurse health care services was for the provision of child health care on site.

beginning with most frequent response at the top of the figure to least often at the bottom. The number one request for nurse health care services was for the provision of child health care on site. The most frequently identified

type of health care service requested was for physical examinations (both child and employee). Other examples of needed services in order of

frequency included immunizations, periodic visits, sick child assessment, TB skin tests, and medication administration.

Figure 2. How Public Health Nurses Can Be of Most Help to Childcare Providers

1. Provide health care services
2. Provide advice and information
3. Provide staff training
4. Perform screenings
5. Provide parent training and education
6. Review immunization and medical records
7. Provide referrals, help establish policies, meet government regulations

Listed in frequency from most to least requested

In addition to responding to an open-ended question regarding needs for nurse health care services, respondents were given a list of commonly provided or proposed nurse services and asked to rate them as High, Medium, or Low priority. Results are displayed in Table 2.

Table 2. Need for Nurse Health Care Services

Service	Rural	Urban	All
Staff Physicals)))
TB Skin Tests)))
Developmental Screening)))
Hearing and Vision)))
Hepatitis B Shots)))
Child Immunizations)))
Well Child Checks)))
Sick Child Assessment	0	0	0
Dental Checks	*	0	*
Medication Administration	*	*	*
Treatment for Injuries	*	0	0

)=high priority 0=medium priority *=low priority

Providers in both rural and urban areas rated seven out of the eleven services listed on the assessment question as a high priority. Included among the seven are: staff physicals, TB skin

tests, developmental screening, hearing and vision, hepatitis B shots, child immunizations, and well child checks. Sick child assessment and treatment for injuries were given medium priority overall, and dental checks and medication administration low priority overall.

Table 3. reflects the availability of on site sick care at childcare centers. Fewer than ten percent of respondent sites offer on-site sick care and less than thirty percent provide hearing and vision screening on site. This is consistent with the high prioritization of these services by providers.

Table 3. On-site Health Services

On-site Service	Rural	Urban	All
Sick Care*	6%	7%	7%
Hearing and Vision Screening	21%	30%	29%

*Primarily involves basic care or isolation until parent arrives

When sick care is provided on site it generally involves basic care until a parent arrives. One center mentioned that, although not currently providing sick care, having researched it extensively and another plans to offer sick care in the future. Another respondent commented that the center does not provide sick care but parents think that we do.

Hearing and vision screening is generally provided through a local college, volunteers, local health department, school district, hospital, or through Child Find. One site provides this service only for special needs children. Another described their screening as by observation only.

Need for Nurse Consultation Services

As reflected in Figure 2., the second most requested need for public health nurse services was for advice and information. Providers described the advice and information they referred to as including direct nurse consultation, answering health and safety questions, providing information to staff and parents, phone consultation and/or help line, consulting with

parents about when to keep a sick child home, and providing a newsletter, in that order.

When asked to prioritize a list of common requests for advice and information, four areas received high priority status from both urban and rural providers. These include advice on special needs children, development of guidelines for sick children, development of infectious disease (ID) protocols, and phone consultation for sick children. Referrals to health care providers, OSHA compliance, health promotion, licensure compliance, and advise on safety and playground equipment were rated of medium importance overall. Review of health records and assistance in screening applicant employees were low priority needs. These and related findings are summarized in Table 4.

Table 4. Need for Nurse Consultation

Consultation	Rural	Urban	All
Advice on Special Needs)))
Develop Guidelines for Sick)))
Develop ID Protocols)))
Phone Consultation for Sick)))
Review Immunizations)	*	*
OSHA Compliance	*	0	0
Referrals to Health)	0	0
Health Promotion Programs	0	0	0
Licensure Compliance	0	0	0
Review Health Records	0	*	*
Advice on Safety	0	0	0
Advice on Playground	0	0	0
Help Screen Applicants	*	*	*

)=high priority 0=medium priority *=low priority

Urban and rural respondents differed in their need for assistance with immunization review. Rural providers rated immunization review as a high priority in their centers whereas urban providers set it as a low priority. When asked about their method for keeping immunization records current, the most common method cited by providers overall was periodic file review followed by the use of a tickler file. The least

common method cited was using a nurse consultant for review. Rural providers, however, appear to use or desire to use nurse consultants for immunization record review more regularly than urban providers.

The second most requested need for public health nurse services was to provide advice and information. . . to include advice on special needs children, development of guidelines for sick children, development of protocols, and phone consultation for sick children.

Approximately five percent of respondents said that they use a computerized immunization tracking system. Findings are displayed in Table 5.

Table 5. Method Used to Keep Immunization Records Current

Method	Rural	Urban	All
Tickler File	0	0	0
Health Dept Monitor	*	-	-
Nurse Consultant	-	*	*
Periodic File Review)))

)=most common method 0=next most common method -=less common method *=least common method

Advice on special needs children was recorded as a high priority for the majority of childcare provider respondents. When asked to describe the special needs of children in their care, providers generated an extensive list including twenty-three different disorders from speech and language problems to chromosomal abnormalities. The ten most frequently cited problems are listed below in order of the frequency in which they were cited. This list summarizes 317 responses.

1. Speech and language problems
2. ADD/ADHD
3. Cerebral palsy
4. Behavioral/learning disabilities
5. Developmental delay
6. Deaf/hearing impaired
7. Downs syndrome
8. Autism
9. Asthma
10. Vision impaired

Greater than one third of centers reported having one to five special needs children in their care. Nearly ten percent had six to ten special needs children. The average number of special needs children in both rural and urban centers is three. Specific results are reported in Table 6.

Advice on special needs children was recorded as a high priority for the majority of childcare provider respondents.

Table 6. Number of Special Needs Children Enrolled in Center

Special Needs Children	Rural	Urban	All
No Response	4%	9%	8%
None	36%	43%	42%
1 to 5 Children	43%	34%	36%
6 to 10 Children	13%	8%	9%
11 to 15 Children	2%	2%	2%
16 to 20 Children	0	2%	1%
21 to 53 Children	2%	2%	2%
Average Number of Special Needs Children Enrolled per Center	3	3	3

Staff Training Needs

Over the past twelve months, respondent agencies reported that two-thirds of their

childcare staff had completed training in universal precautions. Two-thirds of those in urban areas also were trained on center policies and procedures. Between one-third and two-thirds of rural and urban center staff received training in communicable diseases, injury prevention, and child abuse and neglect. Less than one-third of all staff were enrolled in fever management and acute care training. Results are displayed in Table 7.

Table 7. Staff Training During Last Twelve Months

Topic	Rural	Urban	All
Universal Precautions)))
Policies and Procedures	0))
Communicable Diseases	0	0	0
Injury Prevention	0	0	0
Child Abuse/Neglect	0	0	0
Nutrition	0	*	*
Fever Management	*	*	*
Acute Care	*	*	*

)=more than two-thirds of staff

0=between two-thirds and one-third of staff

*=less than one-third of staff

Inadvertently left off the list of training possibilities on the assessment tool was training for CPR/First Aid. Eighty-nine centers told us that their staff had received training in this area over the past year. Approximately three percent also noted staff training in medication administration. Medication administration training for childcare providers is now mandatory in the state of Colorado for licensed childcare providers.

Training, where conducted, was generally provided on site, followed in frequency of location by childcare conferences, local Resource and Referral agencies, and local colleges. Regarding off-site training, rural

centers depended more heavily on local colleges than urban centers, perhaps a reflection of less availability of conferences to rural centers. Other sources of training for both rural and urban centers included Heart Smart, the American Red Cross, Schools, and local hospitals. Training was reported as adequate eighty to ninety percent of the time. See Table 8.

Table 8. Source of Staff Training

Source	Rural	Urban	All
On Site	1	1	1
Child Care Conferences	3	2	2
Local Resource/Referral	4	3	3
Local College	2	4	4
Other common sources of training:			
Heart Smart	School District		
American Red Cross	Hospital		

In addition to assessing current training activity, providers were asked about their current unmet needs for health and other types of training. As depicted in Figure 1., staff training was the third most frequently requested type of nurse consultant service.

Possibly related to licensure requirements, the top three health training needs reported were for first aid, CPR, and universal precautions. Most childcare staff are already certified in these areas (see Table 11.) but the continual need for renewal and orientation of new childcare staff are probable reasons for their ongoing high training priority. Findings are displayed in Tables 9. and 10.

Table 9. Need for Health Training

Health Training	Rural	Urban	All
First Aid)))
CPR)))
Universal Precautions)))
Emergencies)	0)
Special Needs Children	0	0	0
Infection Control	0	0	0
Medication	0	0	0
Identifying Sick Children	*	0	0
Lice	*	*	*
Pink Eye	*	0	0
Chickenpox	*	*	*
Preventive Dental care	*	*	*

)=high priority 0=medium priority *=low priority

Staff training was the third most frequently requested type of nurse consultant service.

As noted in Table 10., topics of lowest priority included potty training, seatbelt use, bike helmet safety, lice, chickenpox, and preventive dental care. The low priority status of

dental care is consistent with the low priority for nurse consultation in this area as previously noted.

Several training topics were rated of medium priority with a few discrepancies between rural and urban areas. Although advice on infection control, special needs children and the identification of sick children were high priorities for nurse consultation, they were of medium priority for staff training. Perhaps these are areas where childcare staff would rather defer to the expertise of a nurse than develop their own proficiency. In contrast, the need for training in medication administration appears to be greater than the need for the service to be provided directly by a nurse.

Table 10. Need for Other Health Training

Other Health Training	Rural	Urban	All
Behavior and Discipline)))
Signs of Neglect/Abuse)	0)
Child Growth/Development	0	0	0
Communicating with	0	0	0
Injury Prevention	*	0	0
Playground Safety	0	0	0
Food Safety	0	0	0
Potty Training	*	*	*
Nutrition	0	0	0
Poison Control	0	0	0
Hygiene	*	0	0
Seatbelt Use	*	*	*
Bike Helmet Safety	*	*	*

)=high priority 0=medium priority *=low priority

Table 11. Percent of Childcare Staff Certified

Method	Rural	Urban	All
CPR Certified	73%	76%	75%
First Aid Certified	65%	75%	74%
Planning to Become Certified in Medication Administration	20%	26%	25%

Training with regard to behavior and discipline was given the highest priority of all other health related training topics. Signs of child abuse and neglect training were of high importance overall, particularly in topics that included child growth and rural centers. Of moderate priority were development, communicating with parents, injury prevention, playground safety, food safety, nutrition, poison control, and hygiene.

Signs of child abuse and neglect training were of high importance overall, particularly among rural centers.

Although nutrition and safety were identified within the top three needs of the children in their care, providers gave medium priority to training in these areas.

Perhaps providers have established other sources of nutrition and safety training.

Need for Child and Family Services

Four of seven areas listed on the assessment regarding nurse services for children and families were given high priority by provider respondents. These include:

- Parent information on when to keep a sick child home
- Parent information on when to take a sick child to the doctor
- Parenting classes
- TV watching guideline for parents

Smoking cessation classes for parents and exercise programs for families and children were given a low priority overall. However, rural providers rated parent smoking cessation classes as a high priority and exercise as medium priority.

There was a moderate interest overall in having nurses assist families in learning about the provision of nutritionally balanced meals. It was a high priority interest area for rural providers. Table 12. displays results.

Table 12. Need for Services for Children and Families

Service/Training Topic	Rural	Urban	All
When to Keep a Sick Child Home)))
When to Take a Sick Child to the Doctor)))
Parenting Classes)))
TV Watching Guidelines)))
Smoking Cessation for Parents)	*	*
Nutritionally Balanced Meals)	0	0
Exercise Program	0	*	*

)=high priority 0=medium priority *=low priority

Current Nurse Childcare Consultant Utilization

Providers were asked how often in the past twelve months they had consulted with a nurse regarding some aspect of their services. Over three-fourths of providers who responded to this question said that they have used a nurse consultant at least once in the past twelve months. Sixteen percent (55 providers) did not respond to this question. Assuming that non-response equates with non-use, the recalculated proportion of users of nurse consultants would be two-thirds rather than three-fourths.

Approximately two percent of respondents employ their own nurse consultant. Sometimes this nurse is a full time employee. In one center the nurse is employed as an infant caregiver. In another, the nurse is on site at least eight hours per week and available by pager at all times.

Nurse consultants are more often utilized in urban centers than in rural ones. This perhaps is more of a reflection of relative differences in availability as opposed to need. Nearly half (49%) of urban centers reported using a nurse consultant six or more times

Nurse consultants are more often utilized in urban centers rather than rural ones. This perhaps is more a reflection of relative differences in availability rather than need.

over the past year compared to thirty-two percent of rural centers. Forty-five percent of rural centers reported using a nurse consultant one to five times per year. Table 13. details findings.

When asked what they paid, or would pay for, a contract nurse consultant, the majority of urban respondents (59%) reported paying or anticipated paying \$25 to \$50 per month. Twenty-three percent said that they paid or would pay less than \$25 per month, eight percent paid more than \$50 per month. Rural providers reported more variation in contract nurse payment. Thirty-five percent pay, or would pay, less than \$25 per month, 35 percent, \$25 to \$50

Although advice on infection control, special needs children, and the identification of sick children were high priorities for nurse consultation, they were of medium priority for staff training. Perhaps these are areas where childcare staff would rather defer to the expertise of a nurse rather than develop their own proficiency.

per month, and 25 percent, more than \$50 per month.

Table 13. Use of Nurse Consultation in Past Twelve Months

Frequency	Rural	Urban	All
Never	23%	23%	23%
1 to 5 Times	45%	21%	23%
6 to 9 Times	10%	21%	20%
10 to 12 Times	16%	13%	14%
More Than 12 Times	6%	15%	14%
Other	0	7%	6%

Sixteen percent of centers chose not to answer this question. Approximately 2 percent of respondents employ their own nurse consultant.

Some respondents gave hourly rates for contract nurse consultants rather than monthly rates. Hourly rates ranged from \$25 to \$40 per hour. Some said that they could not estimate a rate because it would be dependent on use. Others reported that they would like to use the services of a nurse consultant but had no budget for their services. One respondent noted that she could barely pay her staff let alone a nurse consultant.

Approximately two-fifths of those surveyed did not or could not answer this question because they did not know or said that they would have to ask someone else. Results are displayed in Table 14. on the next page.

Public health nurses who were interviewed for this study shared several observations and insights regarding their work with childcare providers in their area. Several nurses expressed their concern regarding provider compliance with state regulations requiring that a nurse with a specialty in maternal and child health consult with centers that care for toddlers. These

nurses observed centers where a parent who happened to be a nurse, but without maternal child health expertise, was

Nurses want to do more. They perceive a need greater than they are being asked to fill. "Some providers don't call unless they have to," commented one nurse.

designated as the nurse consultant. Their understanding was that the parent nurses had no formal roles or responsibilities and were not formally compensated for their consultation.

newsletter, immunization review, and daily phone availability. Monthly contractual fees for these combined services range from \$35 to \$65 per month.

Nurses talked about the need for ongoing provider training that they observed at centers. Some centers struggle with meeting minimum training requirements for licensure. According to nurses, many childcare center staff need more education in the areas of:

- Sick child triage
- Nutrition and feeding
- Playground safety
- Child abuse and neglect
- Infection control
- Product recall and safety
- Frequent health problems
- Emergencies
- Preventive dental care
- Communication with parents
- Discipline and aggressive behavior
- Medication administration
- Child development

Table 14. Current or Anticipated Monthly Pay for a Contract Nurse Consultant?

Fee Range	Rural	Urban	All
Less Than \$25 per	35%	23%	26%
\$25 to \$50 per Month	35%	59%	54%
\$51 to \$60 per Month	10%	3%	5%
More Than \$60 per	5%	5%	5%
Other	15%	10%	10%

Approximately two-fifths of those surveyed did not or could not answer this question because they did not know the answer or would have to ask someone else.

All nurses interviewed cited a pressing need for a nurse partnership with childcare center providers. Several perceived that there existed financial barriers to contracting for nurse consultation services. However, nurses who are associated with local health departments are able to provide low or reasonable cost childcare consultative services as a health department subsidized service. It is not uncommon for a local public health nurse to offer a package of contract services monthly which might include staff or parent education, an on-site visit if requested,

Most nurses prefer to deliver education on site giving them a presence at the center to develop skill building and observe application of training. Other needs identified by nurses include the development of sick child protocols and protocols for inclusion/exclusion of sick children from centers. Some nurses also felt that centers require more education regarding licensure.

Nurses are most often called upon by childcare centers to provide traditional services such as immunizations, staff physicals, TB skin tests, and the basic staff education required for licensure, i.e. CPR/First Aid and universal precautions. Nurses want to do more. They perceive a need greater than they are being asked to fill. Some providers don't call unless they have to, commented one nurse.

One nurse spoke of providing free immunization record checks to all providers in her area who wanted them. This free service generated relationships with approximately 50 percent of those contacted: *Now they call for questions regarding diagnosis of pink eye and when to keep a sick child home.* Free health and safety newsletters and educational materials are other means by which nurses have engaged providers.

Nurses must be available and responsive to provider needs. Those who do not possess necessary competencies must be trained. Creative strategies for building trusting supportive learning environments for childcare staff must be employed.

Nurses must be available and responsive to provider needs. Those who do not possess necessary competencies must be trained. Creative strategies for building trusting supportive learning environments for childcare staff must be employed.

The information in this study should guide the future development of nurse provider partnerships and serve as a basis for the design of programs and consultative services. It can also serve as a template for nursing curriculum design and be used to structure expectations for quality measures in centers. Above all, it provides compelling information in support of the promotion of health, safety, and well-being of children in childcare centers throughout the state.

Summary and Conclusions

Nurses and childcare providers concur that nurses have a role in the health and safety of children cared for in childcare centers. Beyond the traditional public health functions that nurses have provided, they can help centers by providing training, skill building, and support to childcare staff as well as assessment and referral of the children in their care. The health and safety of numerous children can be enhanced through guidance and collaboration with providers. Due to the relatively new or enhanced arrangement this establishes between providers and nurses, strategies must be developed to engage providers in trusting and receptive relationships. Providers must clearly identify the health and safety competencies and deficiencies of childcare staff and parents. Deficiencies must be translated into requests for nurse consultation.

Data Values for MCH Indicators, By Race/Ethnicity, Colorado.

First Trimester Care % of Births	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
All Races	76.4%	77.8%	78.6%	79.0%	79.5%	80.7%	80.4%	81.4%	82.9%	82.2%
Black	62.4%	65.0%	65.0%	67.3%	67.1%	69.9%	72.9%	75.5%	77.3%	75.9%
Hispanic	58.8%	62.0%	63.8%	63.3%	63.8%	65.7%	65.9%	66.7%	69.6%	68.2%
White	81.4%	82.8%	83.6%	84.4%	84.8%	85.8%	85.6%	86.6%	87.9%	87.9%
Low Birth Weight % of Births	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
All Races	N/A	8.0%	8.2%	8.5%	8.4%	8.5%	8.5%	8.9%	8.9%	8.7%
Black	N/A	15.9%	15.5%	17.1%	14.9%	15.4%	15.9%	15.1%	15.3%	13.5%
Hispanic	N/A	8.6%	8.9%	8.7%	8.7%	8.8%	8.2%	8.7%	9.1%	8.4%
White	N/A	7.3%	7.4%	7.8%	7.8%	7.9%	8.0%	8.5%	8.3%	8.3%
Infant Mortality Rate Per 1,000 births	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
All Races	N/A	8.8	8.4	7.6	7.9	6.9	6.5	6.6	7.0	6.6
Black	N/A	19.5	17.9	15.0	17.5	20.7	16.5	14.8	16.3	16.0
Hispanic	N/A	9.9	10.2	10.1	8.8	8.1	8.0	7.1	6.9	7.7
White	N/A	7.8	7.3	6.6	7.0	5.8	5.4	6.1	6.6	5.8
Teen Fertility Rate Per 1,000 births	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
All Races	30.5	33.0	34.5	36.3	35.0	34.8	33.2	30.8	30.8	30.2
Black	N/A	N/A	86.2	78.6	71.5	64.6	56.7	46.4	45.2	53.4
Hispanic	N/A	N/A	84.4	91.6	86.6	89.5	91.0	84.9	94.2	93.0
White	N/A	N/A	21.0	21.5	21.9	21.6	20.0	18.3	16.5	16.0

SIDS Deaths Per 10,000 Ages <1	1990-92	1991-93	1992-94	1993-95	1994-96	1995-97	1996-98
All Races	20.3	20.3	16.8	15.0	10.6	9.8	8.0
Black	35.6	41.2	40.7	41.1	32.7	23.2	22.4
Hispanic	22.7	23.0	19.8	16.4	12.8	11.8	7.9
White	19.2	18.6	14.8	12.9	8.6	8.5	7.4
Childhood Mortality Rate Per 100,000 Ages 1-14	1990-92	1991-93	1992-94	1993-95	1994-96	1995-97	1996-98
All Races	27.8	28.5	27.2	24.6	23.1	22.5	22.5
Black	46.0	52.8	51.7	43.8	35.8	32.1	35.9
Hispanic	36.5	38.4	38.4	31.3	26.4	26.0	26.3
White	25.2	24.9	23.4	21.8	21.4	20.8	20.6
Motor Vehicle Deaths Per 100,000 Ages 1-14	1990-92	1991-93	1992-94	1993-95	1994-96	1995-97	1996-98
All Races	5.3	5.8	5.9	5.7	5.6	5.4	4.9
Black	3.7	7.0	9.3	9.1	4.9	7.2	5.6
Hispanic	8.2	9.9	10.4	9.6	8.0	7.3	5.9
White	4.8	4.9	4.8	4.8	5.1	4.8	4.6
Motor Vehicle Deaths Per 100,000 Ages 15-19	1990-92	1991-93	1992-94	1993-95	1994-96	1995-97	1996-98
All Races	30.7	28.8	30.7	32.1	32.6	29.3	26.9
Black	17.8	14.8	20.3	19.7	16.4	21.1	20.3
Hispanic	33.9	38.1	50.7	49.3	46.0	34.7	26.4
White	31.9	28.2	27.3	29.3	31.2	28.8	27.6

Data Values for MCH Indicators, By Race/Ethnicity, Colorado.

Firearm Deaths Per 100,000 Ages 0-19	1990-92	1991-93	1992-94	1993-95	1994-96	1995-97	1996-98
All Races	6.0	6.2	6.3	6.0	5.2	4.9	4.7
Black	13.9	16.6	15.5	18.8	15.5	15.3	10.4
Hispanic	9.6	9.7	10.8	9.0	9.3	7.9	7.8
White	4.8	4.9	4.8	4.4	3.6	3.5	3.6
Teen Homicide Rate Per 100,000 teens	1990-92	1991-93	1992-94	1993-95	1994-96	1995-97	1996-98
All Races	9.9	11.3	11.1	10.4	9.0	8.3	8.8
Black	38.6	56.1	57.9	67.7	51.9	55.3	40.7
Hispanic	24.8	24.5	33.8	27.7	29.3	19.4	24.9
White	5.2	6.1	4.3	4.0	2.9	3.4	3.9
Teen Suicide Rate Per 100,000 teens	1990-92	1991-93	1992-94	1993-95	1994-96	1995-97	1996-98
All Races	16.6	16.4	16.2	14.6	12.8	12.5	12.7
Black	8.9	*	*	8.5	8.2	7.9	10.2
Hispanic	18.3	17.2	16.0	13.0	12.6	16.1	14.0
White	17.0	17.1	17.3	15.4	13.1	12.1	13.1

Drowning Deaths Per 100,000 Ages 0-4	1990-94	1991-95	1992-96	1993-97	1994-98
All Races	2.7	2.4	2.1	2.0	2.2
Black	*	*	*	*	*
Hispanic	3.8	3.3	2.4	1.9	1.1
White	2.4	2.2	2.2	2.0	2.3

* Indicates that rates are based on values of 0, 1 or 2.
These rates must be suppressed due to confidentiality issues.

Rates for GIS Maps				
County	Map A 1st Trimester Prenatal Care (%) 1998	Map B Inadequate Weight Gain (%) 1997-98	Map C Low Birth Weight (%) 1998	Map D Teen Fertility Rate per 1,000 Ages 15-17, 1996-98
Adams	79.6	25.3	9.1	36.6
Alamosa	83.0	43.7	8.3	43.7
Arapahoe	85.9	25.3	9.2	19.3
Archuleta	61.4	27.5	8.4	26.4
Baca	78.7	28.7	*	21.1
Bent	81.7	28.7	4.2	44.4
Boulder	84.9	25.3	7.2	17.0
Chaffee	87.2	30.4	6.4	14.6
Cheyenne	78.6	24.6	*	*
Clear Creek	85.2	25.3	7.4	12.3
Conejos	79.5	43.7	7.1	49.9
Costilla	74.5	43.7	18.2	26.5
Crowley	67.9	28.7	*	45.3
Custer	89.5	30.4	10.5	35.5
Delta	77.7	26.6	5.0	42.4
Denver	75.9	25.3	9.7	65.8
Dolores	58.8	27.5	*	*
Douglas	96.5	25.3	8.7	6.7
Eagle	75.4	34.2	8.7	35.6
El Paso	82.4	24.3	9.0	31.8
Elbert	91.4	24.6	7.3	10.2
Fremont	83.6	30.4	9.4	38.3
Garfield	71.6	18.7	9.0	27.3
Gilpin	86.4	25.3	*	15.2
Grand	89.7	34.2	11.8	8.4
Gunnison	94.0	26.6	8.2	7.5
Hinsdale	88.9	26.6	*	43.5
Huerfano	65.7	29.4	9.0	35.2
Jackson	83.3	34.2	*	*
Jefferson	90.4	25.3	8.2	16.4
Kiowa	52.9	28.7	*	*
Kit Carson	78.9	24.6	5.6	27.5
La Plata	66.0	27.5	8.6	17.8
Lake	67.4	30.4	20.2	49.3
Larimer	80.2	24.8	7.9	17.4
Las Animas	71.5	29.4	8.7	39.0
Lincoln	80.4	24.6	14.3	19.4
Logan	70.5	20.5	6.3	34.5
Mesa	88.6	18.7	7.0	32.3
Mineral	100.0	43.7	*	*
Moffat	80.3	18.7	6.2	21.1
Montezuma	72.5	27.5	7.8	26.3
Montrose	69.9	26.6	7.8	34.3
Morgan	70.3	20.5	7.3	68.9
Otero	79.9	28.7	9.4	54.3
Ouray	85.3	26.6	17.6	*
Park	86.9	24.3	16.7	4.5
Phillips	82.4	20.5	8.1	29.9
Pitkin	86.7	34.2	7.4	13.7
Prowers	69.5	28.7	8.8	59.0
Pueblo	78.6	25.3	8.6	48.4
Rio Blanco	80.3	18.7	9.8	8.8
Rio Grande	81.4	43.7	8.4	42.3

Rates for GIS Maps				
Routt	90.3	34.2	7.1	7.4
Saguache	70.1	43.7	6.2	72.2
San Juan	57.1	27.5	*	*
San Miguel	84.4	26.6	10.9	5.7
Sedgwick	82.9	20.5	*	*
Summit	89.4	34.2	9.0	15.9
Teller	84.6	24.3	10.1	16.8
Washington	81.4	20.5	*	16.1
Weld	66.0	24.8	7.4	42.2
Yuma	79.1	20.5	5.4	14.3

* Indicates that rates are based on values of 0, 1 or 2. These rates must be suppressed due to confidentiality issues.

Family and Community Health Services Division
Vision of the Future

We see (a future with):

- C Communities that value and promote health and assure access to health care services;
- C Families who provide a safe, supportive environment for optimal well-being; and
- C Individuals who have the knowledge, support and motivation to be as healthy as possible.

To achieve our vision, the Family and Community Health Services Division will:

- C Lead efforts to improve the health of the public;
- C Seek partners to achieve common goals;
- C Embrace public health principles and priorities;
- C Innovate and seek creative solutions;
- C Eliminate gaps in services and reduce fragmentation;
- C Extend beyond program boundaries;
- C Efficiently and effectively use resources; and
- C Maintain an infrastructure with sufficient resources and flexibility to respond to change.

08-10-98

MISSION

The Family and Community Health Services Division, in collaboration with public and private partners, provides leadership and resources to promote the health and well-being of individuals, families and communities in Colorado.

VALUES

1. Integrity/Honesty
2. Service (Customer focus, responsiveness accessibility)
3. Accountability (Evidence-based practice, effectiveness, outcomes, efficiency)
4. Excellence (Dedication, high standards, quality)
5. Leadership (Proactive, empowerment, learning advocacy)
6. Collaboration/Teamwork (Family involvement, locals)
7. Innovation/Creativity/Flexibility
8. Respect/Diversity
9. Health Promotion/Prevention
10. Communication

GOALS

1. Develop partnerships to achieve common objectives
2. Provide leadership that improves the health status of the public, building on public health principles.
3. Research and implement innovative and creative strategies that will advance individual, programmatic, and departmental objectives.
4. Maintain and improve a customer focus that is responsive, accessible, and respectful of diversity.
5. Maintain and enhance quality family and community health services by using resources efficiently and effectively.
6. Each member of FCHS will actively contribute to an organizational culture that values and supports individual contributions, teamwork, and diversity.

The firearm brief, “Firearm Child Fatalities, Colorado 1993-1997,” can be found as a PDF file at: <http://www.cdphe.state.co.us/pp/cfrc/fbfinal.pdf>

Colorado Maternal Mortality Review Committee Brief

June 2000

Maternal Mortality in Colorado 1990-1997

Colorado Maternal Mortality Review Committee

The Colorado Maternal Mortality Review Committee (MMRC) is composed of a multi-disciplinary team of professionals who review all deaths to Colorado women that occur during pregnancy or within one calendar year of the termination of pregnancy.

The goals of the Committee are to:

- ✓ Identify trends and risk factors for pregnancy-related death in Colorado;
- ✓ Identify preventable risk factors;
- ✓ Develop strategies for prevention or intervention.

Maternal deaths are classified as either pregnancy-related or pregnancy associated.

A pregnancy-related death is defined as a death resulting from:

- ✓ Complications of the pregnancy itself, or
- ✓ The chain of events initiated by the pregnancy that led to the death, or
- ✓ Aggravation of an unrelated condition by the physiologic or pharmacologic effects of pregnancy that subsequently caused the death during pregnancy or within *one calendar year of the termination of the pregnancy*, regardless of the duration or anatomical site of the pregnancy.

A pregnancy-associated death is defined as:

- ✓ Death of a woman from any cause while she is pregnant or within one calendar year of the termination of pregnancy, regardless of the duration or anatomical site of the pregnancy. In these cases, a woman dies and is coincidentally pregnant – the cause of death is not at all related to the pregnancy.

Only deaths determined by the MMRC to be pregnancy-related are included in this brief.

Identification of Maternal Deaths

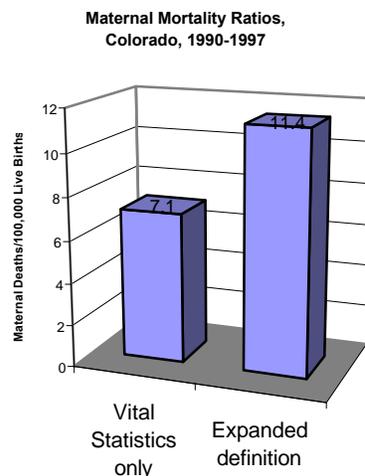
Maternal deaths are most frequently identified utilizing death certificate data from Health Statistics and Vital Records at the Colorado Department of Public Health & Environment. Cases are tabulated as maternal mortalities when the cause of death is coded using one of the appropriate pregnancy-related ICD-9 codes (630-676). The *Colorado Vital Statistics* annual report utilizes death certificate data, where pregnancy status is clearly indicated by ICD-9 code, to tabulate the numbers of maternal mortalities reported each year. This mechanism is not

adequately inclusive because all maternal deaths are not identified as pregnancy-related on the death certificate. The CDC notes that the number of maternal deaths attributable to pregnancy and its complications is estimated to be 1.3 to 3 times that reported in Vital Statistics records (1). In addition, adding in pregnancy-related deaths that occur between 43-365 days postpartum increases the number of maternal deaths identified by 5-10 percent (1).

Given that the current system results in an underreporting of maternal deaths, The Centers for Disease Control and Prevention (CDC) has recommended expanding surveillance. The Colorado MMRC has done this by adopting the CDC's definition of pregnancy-related mortality (which includes deaths occurring within one calendar year of the termination of pregnancy) and employing Vital Statistics linking as a mechanism to increase identification of maternal mortalities. Expanding surveillance by using Vital Statistics linking requires matching the death certificates of all reproductive-age women, age 11-44, with birth and fetal death certificates issued for the year prior to the woman's death. In Colorado, for the years 1990-1997, expanding surveillance with Vital Statistics linking increased the number of pregnancy-related deaths identified by 62 percent.

Maternal Mortality Rate

From 1990-1997, the Maternal Mortality Review Committee identified 50 pregnancy-related mortalities in Colorado (31 identified by Vital Statistics records via ICD-9 codes and an additional 19 identified via Vital Statistics linking). The average maternal mortality ratio^a for Colorado for 1990-1997, based on death certificate identification alone, was 7.1 maternal deaths per 100,000 live births. Adding additional cases identified through expanded surveillance with Vital Statistics linking raised the average maternal mortality rate in Colorado to 11.4/100,000 live births for 1990-1997.



While maternal mortality rates in the United States have consistently declined during the twentieth century, the ratio has remained relatively constant since 1982, averaging about 7.7 maternal deaths/100,000 live births between 1982 and 1996 (2). The 1997 U.S. maternal

^a The National Center for Health Statistics uses the term maternal mortality rate. The term "ratio" is used here instead of rate because the numerator includes some maternal deaths that were not related to live births and thus were not included in the denominator.

mortality ratio was 8.4 maternal deaths/ 100,000 live births ⁽³⁾. The World Health Organization (WHO) estimates that 20 countries have maternal mortality rates below those in the U.S.; the U.S. ranks 21st in maternal mortality ⁽⁴⁾. The rates in both Colorado and the U.S. stand in stark contrast to the Healthy People 2010 goal for maternal mortality of 3.3 maternal deaths/100,000 live births.

Demographic Data

Age

Figure 1 shows pregnancy-related mortality ratios by age for Colorado. Age-related ratios are illustrated in Figure 2 for the U.S. For both Colorado and the nation, mortality ratios generally increase with age with the highest ratios seen in women age 40-44.

**Figure 1: Pregnancy-Related Mortality Ratio, by Age
Colorado, 1990-1997***

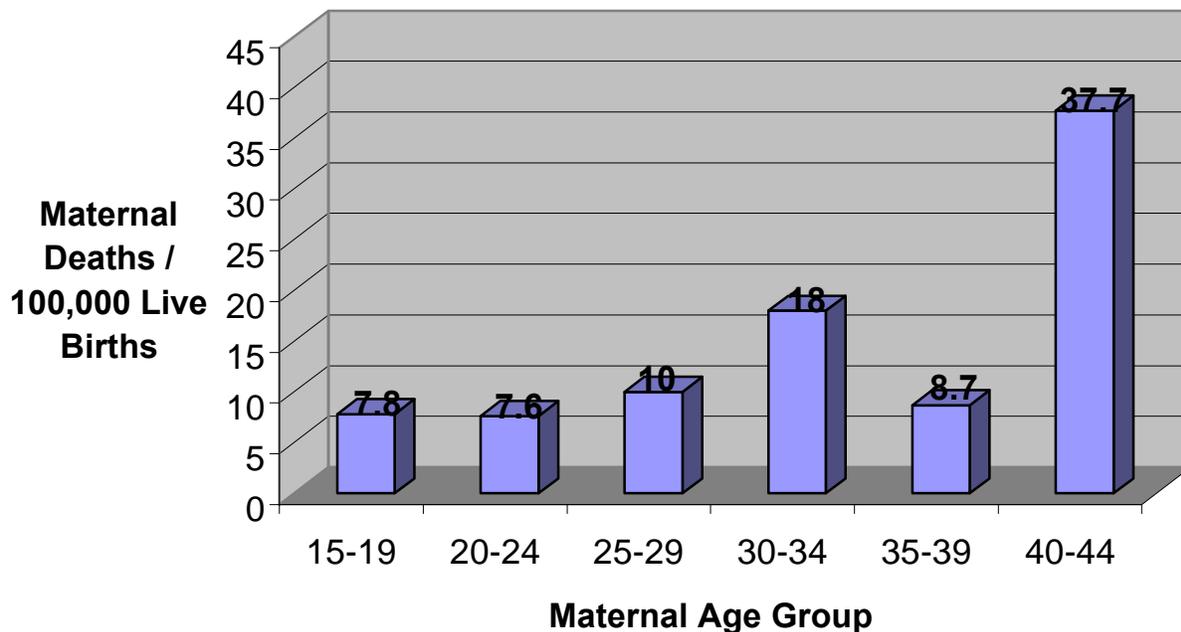
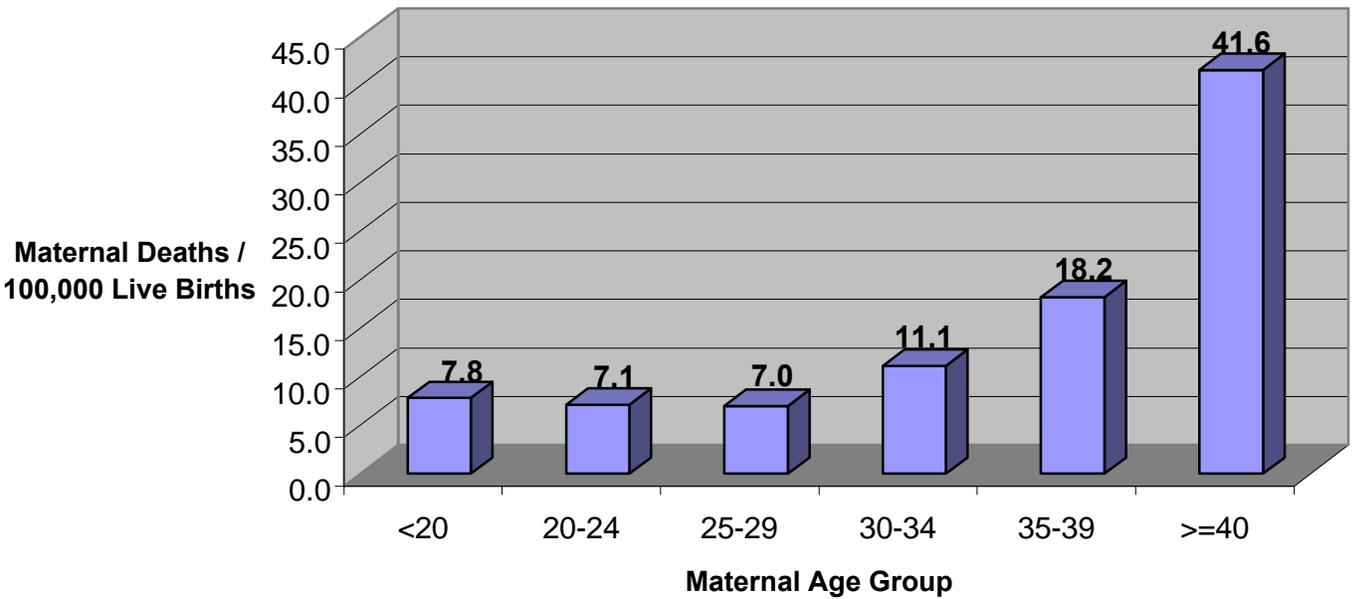


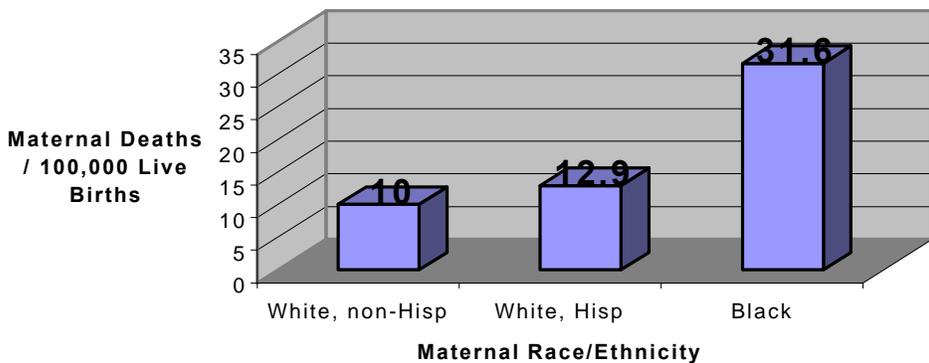
Figure 2: Pregnancy-Related Mortality Ratio, by Age, U.S., 1987-1990



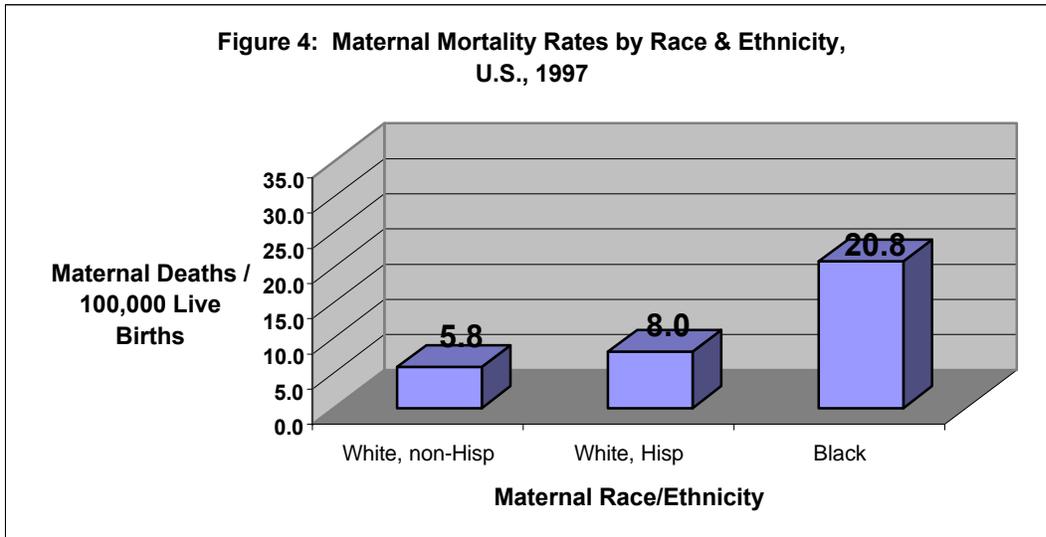
Race/Ethnicity

Figure 3 shows pregnancy-related mortality by race and ethnicity in Colorado.

Figure 3: Pregnancy-Related Mortality Ratios by Race & Ethnicity, Colorado, 1990-1997



Maternal mortality for black women is three times higher than for white, non-Hispanic women in the state. These data are consistent with national data that show an almost fourfold increase in pregnancy-related mortality among black women compared to white women (⁵). U.S. rates for 1997 are displayed in Figure 4. Colorado ratios are higher than U.S. rates for each racial and ethnic group, but the Colorado data include cases identified by Vital Statistics records via ICD-9 coding and expanded surveillance through Vital Statistics linking.



The difference between black and white maternal mortality constitutes one of the largest racial disparities among major public health indicators. Nationally, these mortality rates have remained constant during 1987-1996. Although prenatal care decreases the risk of maternal death, issues related to health care access alone do not fully explain this disparity, as the decrease in mortality for women receiving prenatal care was greater among white than black women (5). Research has suggested that the content of prenatal care may differ for these groups of women (6, 7, 8). Black women receive “fewer services and insufficient health promotion education during their prenatal visits” (7,8). The CDC notes that further research is needed to identify key factors in black maternal mortality, because race most probably serves as a marker for social, cultural, economic and other interrelated risk factors (9).

Marital Status

The pregnancy-related mortality ratio is slightly higher for unmarried women in Colorado compared to married women as noted in Figure 5. U.S data is illustrated in Figure 6. In Colorado, the maternal mortality ratio for unmarried women is lower than the U.S. ratio. Nationally, the maternal death ratio for unmarried women is more than two times higher than that for married women.

**Figure 5: Pregnancy-Related Mortality Ratio, by Marital Status
Colorado, 1990-1997**

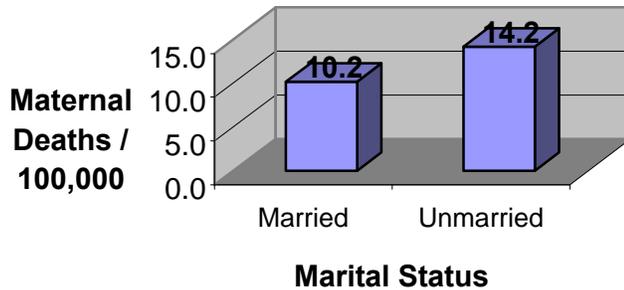
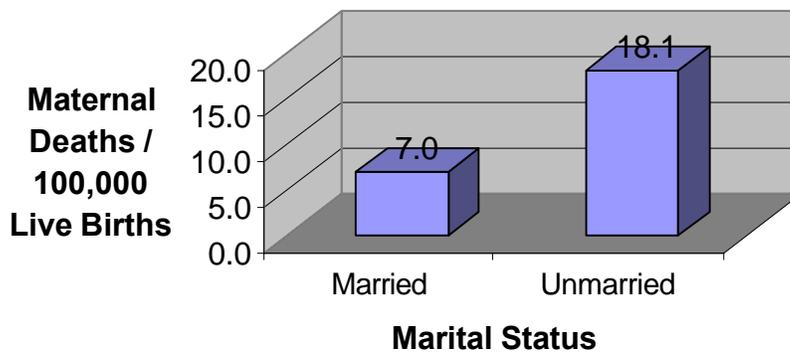


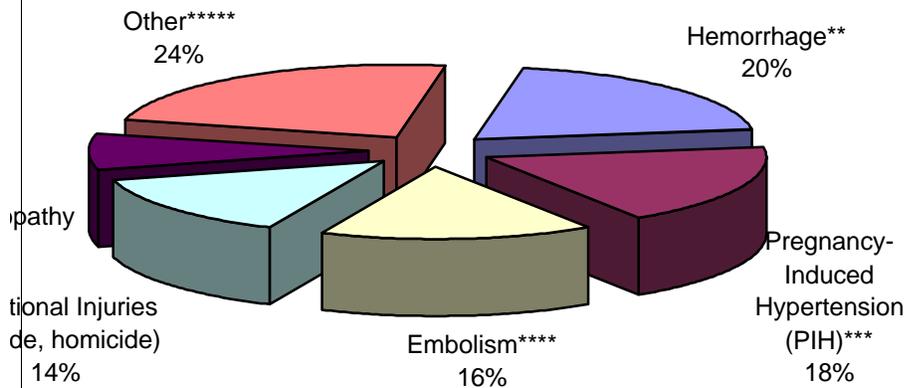
Figure 6: Pregnancy-Related Mortality Ratio by Marital Status - US, 1987-1990



Causes of Pregnancy-Related Mortality

Figure 7 illustrates the most common causes of pregnancy-related death for all pregnancy outcomes in Colorado. The top cause of pregnancy-related death in Colorado (as well as in the U.S.) is hemorrhage. Pregnancy-induced hypertension (PIH) which includes deaths due to pre-eclampsia/eclampsia, and HELLP Syndrome rank second in Colorado and third nationally. Embolism is the third most common cause in Colorado, ranking second in the United States.

Causes of Pregnancy-Related Mortality in Colorado: 1990-1997*



* includes deaths for all pregnancy outcomes, not just live births.

** includes hemorrhage from ruptured ectopic, coagulopathies, uterine rupture, postpartum hemorrhage

*** includes pre-eclampsia, eclampsia and HELLP Syndrome

**** includes pulmonary embolism, thromboembolism and amniotic fluid embolism

***** includes cardiac disease, cancers, pulmonary disease, metabolic problems, collagen disease, infection, etc.

Interestingly, in Colorado, expanding surveillance through Vital Statistics linking has facilitated the identification of a number of deaths resulting from intentional injury (suicide or homicide). In each of these cases, the pregnancy was determined to have initiated the chain of events that led to the maternal death. Out of all maternal deaths due to intentional injury, five out of seven involved the use of firearms. Domestic violence was a recurrent theme, along with a history of depression and/or postpartum depression in the decedent. In the majority of these cases, it did not appear that women were consistently screened and counseled about domestic violence and generalized depression. In addition, the MMRC was unable to determine if these women received anticipatory guidance about postpartum depression. The medical record did not consistently note whether those with a history of domestic violence or depression were referred to or were able to access mental health or counseling resources.

Interestingly, for 1997-1998, The Colorado Pregnancy Risk Assessment Monitoring System (PRAMS)^b noted that 5-6 percent of women experienced physical abuse (from any person, including the husband or partner) before pregnancy, with 3-4 percent reporting physical abuse during pregnancy. Of note, slightly under 30 percent of postpartum women during 1997-1998

^b The Colorado Pregnancy Risk Assessment Monitoring System (PRAMS) is an on-going population-based surveillance system designed to supplement vital records data and generate state-specific data for planning and assessing perinatal health programs. Each month, a random sample of postpartum women are surveyed about a variety of perinatal health issues.

stated that their health care providers talked to them about physical abuse during the course of their prenatal care (11).

For 1997-1998, 17-18 percent of PRAMS respondents reported being moderately to very depressed during the postpartum period; 1-2 percent of those were depressed enough that they “had to get help.” Approximately 67 percent of respondents over the two-year period noted that their prenatal or delivery care provider discussed postpartum depression (11).

Cardiomyopathy is the fifth most common cause of pregnancy-related death in Colorado. Pregnancy-related deaths from cardiomyopathy are often not identified since half of all deaths from this cause occur after 43 days postpartum, the end of the traditional postpartum period. Use of the CDC’s criteria for defining maternal death up to one year postpartum along with expanded surveillance through Vital Statistics linking has enabled the Colorado MMRC to identify these deaths and include them in the maternal mortality statistics for Colorado.

Preventability

The CDC estimates that over half of all maternal deaths could be prevented with existing interventions (1). Similarly, in Colorado, among those cases where preventability could be determined, half were considered to be preventable. The Colorado MMRC groups prevention strategies into several broad categories: health care provider education, client education, referral or resource issues, systems issues, community education, cultural or legislative issues.

Prevention Strategies

Prevention strategies to decrease pregnancy-related death in Colorado include:

Health care provider education/Resource or Referral Issues

- ✓ ***Assuring that high risk conditions are promptly diagnosed and managed.*** In response to the number of deaths resulting from pregnancy-induced hypertension and HELLP Syndrome, the Colorado MMRC developed an educational videotape for health care providers about HELLP Syndrome. In addition, review of several deaths resulting from breast cancer underscored the importance of assuring that all pregnant women have a thorough clinical breast exam at the initial prenatal and 4-6 week postpartum visit, even if they have had a breast exam within the last year.
- ✓ ***Addressing lifestyle and behavioral risks at the routine prenatal visit.*** Prenatal and postpartum care providers should screen all pregnant women for generalized and/or postpartum depression. Those women with a positive history should be referred to appropriate resources for mental health care/counseling. They should be followed closely to ascertain that these services have been accessed. Pregnant women should be also screened for domestic or intimate partner violence. Those women with a positive history should be referred appropriately.
- ✓ ***Accurate completion of the death certificate***

A newsletter article has been distributed through the professional medical societies in Colorado reminding health care providers to note on the death certificate whether or not pregnancy contributed to the cause of death. National revisions of the death certificate, which should be implemented in 2003, include fields for indicating if the decedent was pregnant at the time of death or within the first year postpartum. More accurate reporting by providers along with proposed changes in the death certificate will lead to better identification of pregnancy-related mortalities in Colorado, allowing the development of strategies for prevention.

Client/Community Education

✓ ***Increasing awareness among the general population about maternal mortality.***

Consumers should be better informed about pregnancy-related complications such as pregnancy-induced hypertension and HELLP Syndrome as well as signs and symptoms of pregnancy, especially ectopic pregnancy. Increasing awareness among childbearing-age women, as well as the general population, about mental health issues such as depression, including postpartum depression, and domestic violence is also important.

✓ ***Encouraging childbearing-age women to clarify their insurance coverage for pregnancy-related conditions, prior to pregnancy.***

Women should ascertain which procedures are covered under their policy, clarify length of stay provisions and the insurance company's definition of pregnancy complications.

Systems Issues

✓ ***Advocating with payors of health care for coverage for multi-disciplinary approaches to prenatal care.*** Broader access to social work/mental health consultation during pregnancy and the postpartum period could assist women in dealing with domestic violence and depression. Reimbursement of services to assist women suffering from mild-moderate postpartum depression may prevent more serious sequelae.

Cultural Issues

✓ ***Identifying the reasons why maternal mortality is so high among black women in Colorado.*** The Colorado Department of Public Health and Environment has begun to examine health disparities among various populations in the state. Studying reasons why pregnancy-related mortality is so high among black women in Colorado is a high priority.

Summary

While maternal mortality has decreased dramatically in Colorado and the nation during the twentieth century, maternal mortality ratios in Colorado and the United States continue to exceed the Healthy People 2010 goal of 3.3 maternal deaths per 100,000 live births. In Colorado, pregnancy-related death is more likely to occur in black women and among women age 40-44. The most common causes of pregnancy-related death in Colorado are hemorrhage, pregnancy-induced hypertension and embolism. Expanded surveillance has identified a number of maternal deaths resulting from intentional injury, specifically homicide and suicide.

The Colorado MMRC has determined that approximately half of all pregnancy-related deaths in Colorado are preventable. Health care providers, along with childbearing-age women, payors and the community at large must join together to employ the prevention strategies discussed earlier to decrease the incidence of maternal death in Colorado.

References

1. Berg, C.J., Atrash, H.K., Koonin, L.M., et al: Pregnancy-related mortality in the United States, 1987-1990. *Obstetrics and Gynecology*, 1996; 88:161-167.
2. Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, Division of Vital Statistics: Maternal Mortality in the United States, 1982-1996. *Morbidity and Mortality Weekly Report*, 1998; 47(34): 705-706.
3. Healthy People 2010 Objectives. Available at <http://www.health.gov/healthypeople>.
4. World Health Organization: *WHO revised 1990 estimates of maternal mortality: A new approach by WHO and UNICEF*. Geneva, Switzerland: World Health Organization, 1996.
5. Koonin, L., MacKay, A., Berg, C., et al: Pregnancy-related mortality surveillance – United States, 1987-1990. *Morbidity and Mortality Weekly Report*, 1997; 46 (#SS-4): 17-34.
6. Logan MD, et.al: Racial disparities in reported prenatal care advice from health care providers. *American Journal of Public Health*, 1994; 84: 82-88.
7. Brett, K.M., et.al: Differences between black and white women in the use of prenatal care technologies. *American Journal of Obstetrics and Gynecology*, 1994; 170: 41-46.
8. Hansell, M.J.: Sociodemographic factors and the quality of prenatal care. *American Journal of Public Health*, 1991; 81:1023-1028.
9. Kogan, M.D., et. al: Comparing mothers' reports on the content of prenatal care received with recommended national guidelines for care. *Public Health Reports*, 1994; 109: 637-646.
10. CDC: State-specific maternal mortality among black and white women – United States, 1987-1996, *Morbidity and Mortality Weekly Report*, 1999; 48 (23): 492-496.
11. Colorado Department of Public Health and Environment, Health Statistics Section: Colorado Pregnancy Risk Assessment Monitoring System Data, 1997-1998.

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Maternal and Child Health County Data Sets—Examples

<http://www.cdphe.state.co.us/fc/mchdatasets/mchdatahom.asp>

This web site contains background information you may click to including:

- Description of Performance Measures: Each National and State Performance Measure is described, including numerator and denominator definitions.
- Data Sources for County-Level MCH Indicators: The data sources (e.g., Colorado Department of Public Health and Environment) are listed for each National and State Performance Measure.
- Glossary: Commonly used terms are defined (e.g. neonatal mortality rate).

Note:

Examples are provided on the following pages of Alamosa, Denver, Weld, and Yuma counties; these counties range in population size from small to large. For numerators and denominators used in calculating rates, and for specific years the rates and population estimates refer to, please visit the website address shown above.

Preliminary MCH Indicators:

Alamosa County

Performance Measures	County	State		County	State
NPM 1 SSI % rec rehab	N/A	N/A	SPM 1 Teen alcohol %	N/A	53.0
NPM 2 CSHCN degree spec care	N/A	9	SPM 2 Unintended preg % *	45.9	38.4
NPM 3 CSHCN % medical home	N/A	N/A	SPM 3 Child abuse rate	5.6	5.1
NPM 4 Newborn genetic screen	N/A	96.5	SPM 4 Child care consultation	N/A	67.0
NPM 5 Immun age 2	N/A	76.0	SPM 5 MV deaths 15-19	19.8	26.9
NPM 6 Fertility rate 15-17	43.7	30.6	SPM 6 Teen tobacco %	N/A	34.0
NPM 7 Dental sealants % *	27.2	26.0	SPM 7 SBHC %	24.0	5.7
NPM 8 MV deaths 1-14	18.9	4.9	SPM 8 Medicaid dental %	N/A	17.0
NPM 9 Breastfeeding % *	62.3	81.5	SPM 9 IRIS data system %	N/A	25.0
NPM 10 Newborn hearing screen	78.6	87.0	SPM 10 (I) Teen homicide rate	0.0	9.4
NPM 11 CSHCN insurance %	N/A	N/A	SPM 10 (II) Black male teen homicide	0.0	90.7
NPM 12 Uninsured children % *	11.0	8.0	NOM 1 Infant mortality rate	12.9	6.7
NPM 13 Medicaid pd srvc %	N/A	87.8	NOM 2 Black/white IM ratio *	5.2	2.7
NPM 14 Family partic degree	N/A	13	NOM 3 Neonatal MR	8.6	4.3
NPM 15 VLBW percent	1.2	1.3	NOM 4 Postneonatal MR	4.3	2.4
NPM 16 Teen suicide rate	0.0	13.3	NOM 5 Perinatal MR	11.9	10.4
NPM 17 VLBW Level III %	52.6	60.1	NOM 6 Child death rate 1-14	34.5	22.7
NPM 18 Prenatal care %	83.0	81.6	SOM 1 LBW percent	11.2	8.8

Population Estimates

Age groups	Male	Female	Total
<1	136	130	266
1-4	520	497	1,017
5-9	673	642	1,314
10-14	657	646	1,303
15-17	414	434	848
18-19	436	458	894
20-24	852	901	1,755
25-29	571	562	1,131
30-34	564	556	1,120
35-39	607	586	1,192
40-44	584	601	1,184
45+	2,239	2,352	4,594
Total	8,253	8,365	16,618

07-Feb-00

Preliminary MCH Indicators:

Denver County

Performance Measures	County	State		County	State
NPM 1 SSI % rec rehab	N/A	N/A	SPM 1 Teen alcohol %	N/A	53.0
NPM 2 CSHCN degree spec care	N/A	9	SPM 2 Unintended preg % *	38.1	38.4
NPM 3 CSHCN % medical home	N/A	N/A	SPM 3 Child abuse rate	5.3	5.1
NPM 4 Newborn genetic screen	N/A	96.5	SPM 4 Child care consultation	N/A	67.0
NPM 5 Immun age 2	N/A	76.0	SPM 5 MV deaths 15-19	13.0	26.9
NPM 6 Fertility rate 15-17	65.8	30.6	SPM 6 Teen tobacco %	N/A	34.0
NPM 7 Dental sealants % *	N/A	26.0	SPM 7 SBHC %	25.1	5.7
NPM 8 MV deaths 1-14	4.2	4.9	SPM 8 Medicaid dental %	N/A	17.0
NPM 9 Breastfeeding % *	83.7	81.5	SPM 9 IRIS data system %	N/A	25.0
NPM 10 Newborn hearing screen	87.2	87.0	SPM 10 (I) Teen homicide rate	39.1	9.4
NPM 11 CSHCN insurance %	N/A	N/A	SPM 10 (II) Black male teen homicide	148.4	90.7
NPM 12 Uninsured children % *	7.3	8.0	NOM 1 Infant mortality rate	7.8	6.7
NPM 13 Medicaid pd srvc %	N/A	87.8	NOM 2 Black/white IM ratio *	2.4	2.7
NPM 14 Family partic degree	N/A	13	NOM 3 Neonatal MR	5.2	4.3
NPM 15 VLBW percent	1.6	1.3	NOM 4 Postneonatal MR	2.6	2.4
NPM 16 Teen suicide rate	12.1	13.3	NOM 5 Perinatal MR	13.1	10.4
NPM 17 VLBW Level III %	89.4	60.1	NOM 6 Child death rate 1-14	22.2	22.7
NPM 18 Prenatal care %	75.9	81.6	SOM 1 LBW percent	9.9	8.8

Population Estimates

Age groups	Male	Female	Total
<1	4,586	4,367	8,952
1-4	18,270	17,373	35,643
5-9	22,017	20,911	42,927
10-14	18,351	17,416	35,767
15-17	9,683	9,254	18,936
18-19	6,755	6,847	13,603
20-24	15,795	16,451	32,247
25-29	15,084	14,765	29,848
30-34	15,890	15,058	30,949
35-39	21,705	21,323	43,028
40-44	23,547	23,019	46,567
45+	80,439	92,581	173,018
Total	252,12	259,365	511,485

07-Feb-00

Preliminary MCH Indicators:

Weld County

Performance Measures	County	State		County	State
NPM 1 SSI % rec rehab	N/A	N/A	SPM 1 Teen alcohol %	N/A	53.0
NPM 2 CSHCN degree spec care	N/A	9	SPM 2 Unintended preg % *	36.3	38.4
NPM 3 CSHCN % medical home	N/A	N/A	SPM 3 Child abuse rate	4.3	5.1
NPM 4 Newborn genetic screen	N/A	96.5	SPM 4 Child care consultation	N/A	67.0
NPM 5 Immun age 2	N/A	76.0	SPM 5 MV deaths 15-19	39.5	26.9
NPM 6 Fertility rate 15-17	42.2	30.6	SPM 6 Teen tobacco %	N/A	34.0
NPM 7 Dental sealants % *	N/A	26.0	SPM 7 SBHC %	0.0	5.7
NPM 8 MV deaths 1-14	7.6	4.9	SPM 8 Medicaid dental %	N/A	17.0
NPM 9 Breastfeeding % *	84.8	81.5	SPM 9 IRIS data system %	N/A	25.0
NPM 10 Newborn hearing screen	93.1	87.0	SPM 10 (I) Teen homicide rate	4.3	9.4
NPM 11 CSHCN insurance %	N/A	N/A	SPM 10 (II) Black male teen homicide	0.0	90.7
NPM 12 Uninsured children % *	7.5	8.0	NOM 1 Infant mortality rate	7.0	6.7
NPM 13 Medicaid pd srvc %	N/A	87.8	NOM 2 Black/white IM ratio *	0.0	2.7
NPM 14 Family partic degree	N/A	13	NOM 3 Neonatal MR	4.2	4.3
NPM 15 VLBW percent	1.3	1.3	NOM 4 Postneonatal MR	2.8	2.4
NPM 16 Teen suicide rate	21.7	13.3	NOM 5 Perinatal MR	10.5	10.4
NPM 17 VLBW Level III %	70.1	60.1	NOM 6 Child death rate 1-14	20.3	22.7
NPM 18 Prenatal care %	66.0	81.6	SOM 1 LBW percent	8.0	8.8

Population Estimates

Age groups	Male	Female	Total
<1	1,298	1,237	2,535
1-4	5,221	4,987	10,208
5-9	6,565	6,283	12,848
10-14	6,247	6,049	12,296
15-17	3,890	3,787	7,678
18-19	3,336	3,595	6,931
20-24	7,521	7,522	15,043
25-29	6,032	5,795	11,828
30-34	6,024	5,878	11,901
35-39	6,433	6,408	12,843
40-44	6,450	6,669	13,120
45+	24,404	26,598	51,006
Total	83,421	84,808	168,237

07-Feb-00

Preliminary MCH Indicators:

Yuma County

Performance Measures	County	State		County	State
NPM 1 SSI % rec rehab	N/A	N/A	SPM 1 Teen alcohol %	N/A	53.0
NPM 2 CSHCN degree spec care	N/A	9	SPM 2 Unintended preg % *	43.3	38.4
NPM 3 CSHCN % medical home	N/A	N/A	SPM 3 Child abuse rate	7.8	5.1
NPM 4 Newborn genetic screen	N/A	96.5	SPM 4 Child care consultation	N/A	67.0
NPM 5 Immun age 2	N/A	76.0	SPM 5 MV deaths 15-19	90.7	26.9
NPM 6 Fertility rate 15-17	14.3	30.6	SPM 6 Teen tobacco %	N/A	34.0
NPM 7 Dental sealants % *	N/A	26.0	SPM 7 SBHC %	0.0	5.7
NPM 8 MV deaths 1-14	17.1	4.9	SPM 8 Medicaid dental %	N/A	17.0
NPM 9 Breastfeeding % *	74.0	81.5	SPM 9 IRIS data system %	N/A	25.0
NPM 10 Newborn hearing screen	0.0	87.0	SPM 10 (I) Teen homicide rate	0.0	9.4
NPM 11 CSHCN insurance %	N/A	N/A	SPM 10 (II) Black male teen homicide	N/A	90.7
NPM 12 Uninsured children % *	11.0	8.0	NOM 1 Infant mortality rate	8.7	6.7
NPM 13 Medicaid pd srvc %	N/A	87.8	NOM 2 Black/white IM ratio *	5.2	2.7
NPM 14 Family partic degree	N/A	13	NOM 3 Neonatal MR	7.0	4.3
NPM 15 VLBW percent	0.5	1.3	NOM 4 Postneonatal MR	1.7	2.4
NPM 16 Teen suicide rate	0.0	13.3	NOM 5 Perinatal MR	8.7	10.4
NPM 17 VLBW Level III %	75.0	60.1	NOM 6 Child death rate 1-14	20.3	22.7
NPM 18 Prenatal care %	79.1	81.6	SOM 1 LBW percent	4.9	8.8

Population Estimates

Age groups	Male	Female	Total
<1	59	56	115
1-4	252	242	495
5-9	342	323	664
10-14	370	367	738
15-17	232	234	466
18-19	142	145	287
20-24	313	298	612
25-29	287	249	537
30-34	232	242	473
35-39	346	332	678
40-44	403	420	824
45+	1,852	2,124	3,979
Total	4,830	5,032	9,868

07-Feb-00

COLORADO



Child Fatality Review Committee

BRIEF

April 1999

Motor Vehicle-related Child Fatalities Colorado 1995-97

Motor vehicle-related injuries are the leading cause of death for children ages 1-17 years. A subcommittee of the Colorado Child Fatality Review Committee composed of injury prevention and transportation safety specialists reviews all child deaths (ages 0-17) that are related to motor vehicles. Cases are identified by death certificate data from the Division of Health Statistics & Vital Records, Colorado Department of Public Health & Environment. The primary source for crash information is the Fatality Analysis Reporting System (FARS). Motor vehicle accident reports from Colorado and other states are used for those cases that are not included in the FARS data. *Cases in which the original injury occurred in another state and the death occurred in Colorado are included, as are Colorado deaths of non-residents. Crashes that occurred on private property and deaths that occurred more than a month after the crash are also included.* These criteria are different than those used by Health Statistics or FARS, and these data may not match other statistics reported on both state and national levels.

In the three-year period 1995-97, there were 297 child fatalities in Colorado that were the result of motor vehicle crashes. Crashes include motor vehicle, bicycle, and pedestrian collisions. There were a small number of cases in which a child riding a go-cart was struck by a motor vehicle or a child was unattended in a motor vehicle and engaged the gears. These have been classified as "other" for the variable "role."

The 297 motor vehicle-related fatalities were the result of 265 crashes. There were 184 fatalities (62%) in which at least one driver involved in the crash was under 21 years of age. In order to better understand the role of young drivers in child fatalities, crashes in which at least one driver was under 21 were selected for particular attention. Of the 265 crashes, there were 154 (58%) in which at least one driver was under 21 years of age. Some of the tables in this report are based on fatality data and some on crash data (indicated in each table and reflected in the total "n" for each category).

Table 1: Motor vehicle-related child fatalities by age and gender Colorado 1995-97, ages 0-17 years

Age Group	All fatalities, n=297			Driver <21 [†] , n=184		
	Male	Female	Total	Male	Female	Total
0	3	10	13	10	8	18
1-4	19	20	39			
5-9	15	12	27			
10-14	38	32	70	16	16	32
15-17	79	69	148	71	63	134
Total	154	143	297	97	87	184

[†]At least one driver involved in crash was under 21 years of age

Demographics

Overall, males are slightly overrepresented in the group of fatalities (Table 1), as they are in the general population of children less than 18 years of age, resulting in very similar death rates for males and females (9.9 and 9.6 per 100,000 Colorado resident population ages 0-17, respectively, using 1997-based population estimates). The proportion of male fatalities increases in the older age groups, as does the rate at 31.9 per 100,000 for the 15-17 year male age group. Females in the 15-17 year age group have a rate of 29.3 per 100,000.

Prevention Strategy

Begin safe pedestrian, bicycle, and driving messages early...elementary, middle school, and high school.

There is some disparity by race/ethnicity as well. In this age group, white Hispanics represent 16 percent of the population but account for 21 percent of motor vehicle-related fatalities, while white non-Hispanics are underrepresented at 71 percent of fatalities and 76 percent of the population.

Circumstances

Approximately 80 percent of children who died as a result of motor vehicle-related injuries were drivers or passengers in vehicles, including motorcycles, with almost one third of that group driving the vehicle. Table 2 shows the distribution of roles of the child fatalities. Eleven of the 73 young drivers who were killed were under age 16, thirty-three were 16, and twenty-nine were 17. Non-occupant fatal injuries were primarily to pedestrians (14%) and bicyclists (5%).

Prevention Strategy
Pedestrians should be taught to cross at designated intersections or crosswalks after always looking in both directions.

Table 2: Role of deceased child Colorado 1995-97, ages 0-17 years

Role	All fatalities, n=297		Driver <21 [†] , n=184	
	Number	Percent	Number	Percent
Driver	73	24.6%	73	39.7%
Passenger	164	55.2%	97	52.7%
Pedestrian	40	13.5%	10	5.4%
Bicyclist	16	5.4%	3	1.6%
Other	4	1.3%	*	*

[†] At least one driver involved in crash was under 21 years of age
* Fewer than three occurrences

Only 17 percent of children who were drivers or passengers in vehicles in which seat belts or child seats should have been used were restrained. This percentage drops to 13 percent of those fatalities in which at least one driver was under 21 years of age (Table 3). At every age, more children were unrestrained than restrained, including 10 of 13 infants <1 year of age who were not in car seats or were in car seats which were not being used correctly. Only 10 percent of 17-year-olds were restrained, while 19 percent of 16-year-olds were wearing seat belts.

Table 3: Restraint used by decedent[†] Colorado 1995-97, ages 0-17

Restraint	All fatalities, n=233		Driver <21 [†] , n=164	
	Number	Percent	Number	Percent
Yes	40	17.2%	22	13.4%
No	192	82.4%	142	86.6%

[†]Incidents in which decedent was occupant of moving vehicle
[†]At least one driver involved in crash was under 21 years of age

Properly installed child car seats and use of seat belts can prevent both fatalities and injuries. According to the National SAFE KIDS Campaign, child safety seats are extremely effective when correctly installed, reducing the risk of death by 71 percent for infants and by 54 percent for children ages 1-4 years. In January 1998, a Colorado State University survey showed that 90 percent of the time, when adults buckle up, children also use their seat belts. The same study found that in vehicles with unrestrained adult drivers, only 11 percent of children ages 4-15 years were restrained.

Not surprisingly, Friday and Saturday were the days on which the largest number of crashes occurred (19 % each) while Tuesday and Wednesday had the lowest numbers (9% and 10%, respectively). This distribution was basically the same for the crashes in which at least one driver was under 21. More crashes occur in the afternoon and evening than in the morning hours. Two thirds of the 265 crashes occurred between noon and midnight, with almost 19 percent occurring between 3:00 and 6:00 p.m.

Of the 265 crashes, nine occurred in states other than Colorado. The remaining 256 crashes were distributed among Denver metro (Adams, Arapahoe, Boulder, Denver, Douglas, Jefferson), other metro (El Paso, Larimer, Mesa, Pueblo, Weld), and rural counties of the state as follows: Denver metro 88, other metro 74, rural 94. Rural rates are higher than those of the other two groups.

Prevention Strategy
All occupants in vehicle should be appropriately restrained with a car seat or a seat belt, according to size and age.

Prevention Strategy
Education on rural driving safety, including caution at intersections, reduced speed on gravel roads, and stop sign compliance.

Young Drivers

One of the issues that is repeatedly identified when prevention strategies are discussed is that of young drivers. Nationally, although driver ages 15-20 account for 7 percent of the driving population, they are involved in 14 percent of traffic fatalities (“Saving Teenage Lives,” NHTSA). In Colorado, 58 percent of crashes in which children died during 1995-97 involved drivers under the age of 21. Of the 154 crashes involving young drivers, 16-year-old drivers were involved in 37 percent and 17-year-olds in 29 percent (Figure 2).

Prevention Strategy

Encourage *mandatory* driver’s education, including a safe driving component, in high school.

**Figure 2: Age of youngest driver in crashes
In which at least one driver was under 21
Colorado 1995-97, ages 0-17 years**



Prevention Strategy

Graduated licensing allows young drivers to gain the experience they need to become safe drivers.

Driver inexperience was determined by law enforcement to be a factor in at least 27 percent of crashes involving young drivers, while the Child Fatality Review Committee considered inexperience a factor in 73 percent of these crashes. The multidisciplinary nature of the child fatality review process, along with its focus on prevention, probably accounts for their significantly higher emphasis on this issue.

Teenagers may overestimate their driving ability and underestimate the risk involved with driving a motor vehicle. Safediving requires more than understanding how to operate a vehicle, and it is possible that advanced driver’s education that focuses on safety issues could be a valuable complement to more traditional driver’s education. The combination of immaturity and inexperience may account for the high numbers of 16- and 17-year old drivers involved in the crashes that result in child fatalities. Graduated licensing is one strategy that addresses this problem, and it has been implemented in a variety of forms in the states that have adopted it. Some of the components that are typically included are an extended period of driving with adult supervision, a night driving curfew, limits on the number of other teens who can be in the vehicle, and the requirement that all occupants wear seat belts

**Table 4: Determination of related factors
Colorado 1995-97, ages 0-17**

Factors	All crashes, n=265		Driver <21 [†] , n=154	
	Number	Percent	Number	Percent
Inexperience found by law enforcement	43	16.2%	42	27.3%
Inexperience found by child fatality review	114	43.0%	113	73.4%
Speed	134	50.6%	96	62.3%
Alcohol	45	15.2%	23	14.9%

[†]At least one driver involved in crash was under 21 years of age

Excessive speed, either above the speed limit or too fast for conditions, is also a factor in many of these of the crashes and was determined to be related to 62 percent of the crashes in which at least one driver was under 21 compared to 51 percent of all crashes (Table 4). Alcohol (BAC>.05) was present in almost the same proportion of crashes involving young drivers as in child fatality crashes overall, at approximately 15 percent. Drugs were present more often in the crashes involving young drivers at 14 percent compared to 8 percent of the total. The estimates for alcohol and drug involvement in these crashes may be conservative because these tests are not always performed

Prevention Strategy

Increase awareness of *adverse weather* driving safety – lower speeds and extra room between vehicles.

Conclusions

The word “accident” implies an act of fate about which nothing could be done. The words we choose can affect how others view events. Data support the hypothesis that most motor vehicle crashes are not truly accidents but predictable and preventable events.

Data analysis provides a guide for our efforts to understand and prevent this number one killer of children - motor vehicle-related unintentional injuries. Most of us have heard dozens of common sense safety messages, but in the context of preventable child fatalities, these messages can take on new meaning and become real avenues for behavior change and injury prevention. The prevention tips in this report may not be new to the reader, but they address the issues that have arisen time and again as motor vehicle-related child fatalities are reviewed in detail. The fact that motor vehicle-related child fatalities are almost entirely preventable gives us hope that these numbers will be reduced as these safety messages continue to be stressed and individuals choose to incorporate these behaviors into their lives.

A Few Useful Web Sites

National Highway Traffic Safety Administration	http://www.nhtsa.dot.gov/
National Safe Kids Campaign	http://www.safekids.org/
Fatality Analysis Reporting System	http://www-fars.nhtsa.dot.gov/
CDPHE Injury Prevention Specialists	
Child Passenger Safety	Carol Mann (303) 692-2605
Childhood Injury Prevention	Barb Bailey (303) 692-2589

The Colorado Child Fatality Review Committee is a multidisciplinary team which has been reviewing all child deaths that occur in Colorado since 1989. The goals of the committee include describing patterns of child death in Colorado, identifying the prevalence of risk factors for child death, characterizing high-risk groups in terms compatible with the development of public policy, evaluating system responses to children and families who are at high risk and offering recommendations for improvement in those responses, and improving the quality of data necessary for child death investigation and review. A fundamental purpose of the review process is the development and implementation of prevention strategies that are suggested by the in-depth review of the circumstances of each child fatality.

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Colorado Child Fatality Review Committee
CDPHE EMSP-IP-A5
4300 Cherry Creek Drive South
Denver CO 80246-1530



Summary of Current Issues for
*Children with Special Health Care
Needs in Colorado*



Developed by Staff of the Health Care Program
for Children with Special Needs (HCP)
May 2000

**Health Care Program for Children with Special Needs (HCP)
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The information in the summaries enclosed was derived from a number of sources – knowledge and experience of HCP state and regional and local staff; issues related to HCP state staff during local site visits and statewide or regional meetings; questionnaires and surveys of providers; families, HCP state and local staff and other agencies; and specific requests for information on the HCP Annual Report.

The information summarized here will be shared and discussed with public health staff, providers, advisories, community groups and parents through out FY01. Work plans will be developed and implemented based on these discussions for the FY02 MCH Plan.

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CARE COORDINATION FOR CHILDREN WITH SPECIAL HEALTH CARE NEEDS

Background

The marketing programs of Medicaid Health Maintenance Organizations (HMOs) plus the implementation of Child Health Plan + (CHP+) to cover low-income children who are not eligible for Medicaid has greatly increased the number of children covered by health insurance. While improving access to health care has always been a goal of HCP, as more and more children have enrolled in managed care plans, the number of referrals to HCP for care coordination has increased dramatically. Children with special health care needs not only require more services, but they also often need additional support in coordinating referrals, negotiating the benefit structures of the HMO plans, and accessing HCP “wrap-around” funding when HMO benefits do not cover the child’s medical needs. Unfortunately, however, this increase in referrals has not been accompanied with a parallel increase in funding for HCP to provide these services.

Because HCP is not an entitlement program, funds available through the MCH block grant have remained static. Most of the Medicaid and CHP+ children are enrolled in managed care programs. Thus, if HCP is to continue to provide effective care coordination for special needs children, HCP will need to contract with HMOs for reimbursement.

Gaps and Barriers

To be reimbursed by HMOs, one must have a managed care contract, and comprehensive utilization data is needed to negotiate these. HCP needs to track the number of families receiving care coordination, identify the number of families enrolled in each HMO, and provide cost-benefit data in order to justify the investment by HMOs. Currently, HCP does not have the information systems to provide this information, and national outcome data on the benefits of care coordination, which might serve as a substitute, is not available.

In addition to not having the systems to produce the data, HCP is encumbered by a lack of marketing expertise. Until recently, public health programs did not need to “sell” their services; the programs simply existed as part of a network of services and eligible clients were referred as needed. However, with the advent of managed care, public health programs find themselves negotiating with the private organizations that manage the Medicaid and CHP+ HMOs. These organizations often are not familiar with the services required by children with special needs, and they do not know how to access the

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supplemental services available in the public sector. Marketing expertise to make potential contractors more aware of the services offered by HCP would be helpful.

Current Successes

HCP has negotiated one contract with an HMO, Colorado Health Plan of the Rockies (CHPR) that was signed February 2000 and two other contracts are pending.

Current Plans

Colorado Access insures the largest number of special needs children in the state. HCP is currently working with Colorado Access to explore innovative structures for cooperation between the two organizations. Arrangements under consideration range from job sharing by staff of the two organizations to Colorado Access “buying out” positions of local HCP staff whose time would then be dedicated to managing Access patients.

Future Goals

HCP is currently implementing a new electronic patient registration system (IRIS) that is being developed by the Colorado Department of Health and Environment. To properly implement this system, HCP must standardize service delivery, forms, and administrative processes in its Regional Offices across the state. This process has just begun, but represents a critical goal since the registration system is the infrastructure for providing utilization and outcomes data needed for managed care contracting.

CHILD HEALTH PLAN PLUS (CHP+)

Background

CHP+ is a standard health plan providing office visits, well child care, immunizations, prescriptions, glasses, hearing aids, inpatient hospital care and mental health services to children whose families fall below 185 percent of Federal Poverty Level (FPL), are not eligible for Medicaid, and who have no other source of insurance. Services for most of the children enrolled in CHP+ are provided by health maintenance organizations (HMOs).

The benefits structure for CHP+ is designed for basically healthy children who need preventive care and occasional short-term, acute treatment. It is not designed for the chronically ill child with multiple, complex conditions. As a result, coverage often falls short of providing the services required by a child with special health care needs. Some therapy services are limited and the plan has maximum amounts that it will pay for hearing aids, wheelchairs, and other expensive equipment.

HCP works closely with CHP+ and has developed a partnership in which HCP plays two major roles. The first is care coordination. HCP Regional Office staff helps families find appropriate providers. If the child is in an HMO, staff helps the family select a PCP and works with the PCP to coordinate care for the child. Care Coordinators also help the family apply for other programs and help the family coordinate the benefits from these other programs with the CHP+ coverage.

The second role that HCP plays is “wrap-around” coverage for HCP eligible services. Families are encouraged to call their HCP Care Coordinator if there are services that CHP+ does not cover or does not pay in full. For children whose family income falls below 133 percent of the FPL, HCP is able to provide the services or pay the difference between the covered amount and the cost.

Gaps and Barriers

The CHP+ application is complex and difficult for many families to complete. Medicaid must review all CHP+ applications. As a result, families must collect substantial documentation and complete the Resources and Deductible section required by Medicaid. Currently, it is difficult for HCP staff to assist with the application process because HCP is not fully integrated into the application system. However, if HCP Regional Offices were to become Satellite Enrollment Sites, HCP staff could more effectively assist families with these applications.

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Often at the greatest disadvantage are “mixed families” in which some of the children qualify for Medicaid and some qualify for CHP+. Applications in this category are often lost in transit between the county Medicaid office and CHP+, and families end up not getting services from either program. Other applications are delayed for months going through the approval process for both programs. Policies and procedures for passing applications between these organizations need to be clarified. At the same time, thought should be given to expediting a decision for children that are clearly not Medicaid eligible so that those children could start the CHP+ approval process while the others are being considered by Medicaid.

Another issue is that HCP covers families up to 133 percent of Federal Poverty Level while CHP+ covers them up to 185 percent. As a result, families that fall between 134 and 185 percent are not eligible for HCP and are therefore not eligible for “wrap-around” coverage should they need expensive durable medical equipment or therapies.

Current Successes

The HCP Clinical Service Team meets monthly with the Child Health Advocates (CHA) staff to solve common problems and to update each other on policy changes. The groups also work to resolve complicated billing problems, and HCP Regional Office staff often assist families in obtaining SSI eligibility for a child with complex medical problems.

The Clinical Service Team regularly meets with case managers and members of the billing departments of Colorado Access, Rocky Mountain HMO, Kaiser, and Community Health Plan of the Rockies. This has led to better coordination of services for children enrolled in both CHP+ and HCP.

HCP has developed a plan for care coordination that outlines the role and function of the Care Coordinators for special needs children that are enrolled in CHP+. Care Coordinators will assist families in selecting a PCP and finding specialty care providers. The Coordinator will also help the family identify services such as Child Find, the local Community Center Board, the Board of Cooperative Educational Services (BOCES), respite care, child care, parent support groups and Part C services and will help the family organize these services in cooperation with their PCP. HCP has successfully marketed this plan to two CHP+ HMOs. A contract was signed with Colorado Health Plan of the Rockies (CHPR) in February 2000 and there is a second contract pending with Rocky Mountain HMO (RMHMO).

Current Plans

HCP will continue monthly meetings with Child Health Advocates. In addition to ongoing business, these meetings will also explore the possibility of HCP Regional Offices becoming Satellite Enrollment Sites. Although this would likely require additional funding for the Regional Offices, it would improve services to the community and facilitate documentation of services.

HCP will implement the existing care coordination contract with CHPR, finalize the agreement with RMHMO and continue negotiations with Colorado Access, the third CHP+ and Medicaid HMO.

HCP will continue to work with CHP+ in developing policies and expanding services to a wider population. Examples in this category include supporting the retention of the pre-enrollment period for children who have been accepted by CHP+ but have not enrolled in an HMO, encouraging the CHP+ Board to expand coverage to families at 200% of Federal Poverty Level, supporting the CHP+ Board's recommendation to reduce CHP+ premiums, and recommending that additional services such as hearing aids for all children with a hearing loss be added to the CHP+ service package.

Future Goals

Optimally, the resources of HCP, CHP+, Medicaid Baby Care/Kids Care, and private insurance should be combined to build a seamless system of care for children with special health care needs. Such a system would insure that regardless of the family's financial situation or the child's diagnosis, financial responsibility would move from one program to the other without interfering with the continuity of care.

HCP SPECIALTY AND DEVELOPMENTAL EVALUATION CLINICS

Background

HCP Specialty Clinics have been operating throughout Colorado for 30 years. Currently there are 340 of these clinics scheduled, in 32 sites, providing specialty evaluations in pediatric, neurology, cardiology, orthopedics and rehabilitation. In 2000, administration of Developmental Evaluation (D&E) Clinics was combined with the specialty clinics to provide a more consistent and comprehensive clinic program.

Most clinics are offered through HCP Regional Offices, but about 40, primarily in the Southeast section of the state, are managed by county nursing services. Because providers charge nominal fixed costs to staff the clinics, the clinics are a very economical means for providing specialty care. And, since they are offered throughout the state, the clinics are a means for providing specialty care in rural areas that would otherwise not have access to it.

Gaps and Barriers

A major problem with the clinics is providing enough of them to meet the needs of the population. Several larger areas, particularly the Western Slope, are requesting more clinics because there are few qualified providers in the area. In addition, as the population of the state has increased, the number of children who need care has increased.

Despite the longevity of the clinics, several administrative problems continue to be an issue. Because the clinics are dispersed and managed by different offices and groups, record keeping and reporting have never been standardized. As a result, the central office does not have an accurate count of the number of clinics, types of clinics, number of children served, services provided, or pay sources. Exacerbating this problem, D&E Coordinator turnover is common making consistent management for these clinics difficult.

Another administrative problem is that clinics are run on the traditional medical model and often do not take advantage of the benefit that could be gained from a multi-specialty, team approach.

Third-party reimbursement is also an issue. Although HCP has a contract with Colorado Access for D&E, payment is often denied even when the visit has been pre-authorized by the Primary Care Provider.

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Current Successes

Overall, reception of the clinics by HMOs has been positive. Rocky Mountain HMO (RMHMO), Colorado Health Plan of the Rockies, Colorado Access and Medicaid have all agreed to pay for clinics.

Patient and provider satisfaction with the clinics remains high. A recent survey of clinic participants indicates that both families and professionals are very supportive of the clinics.

The clinic program continues to expand and explore new programs and methods of delivery. A neurology clinic for attention deficit disorder has begun in Rocky Ford; a D&E training program using tele-education has been implemented; and there have been attempts to use telemedicine with the cooperation of RMHMO that could set a precedent for other HMOs and Medicaid.

Current Plans

To further justify HMO sponsorship of the clinics and to expand the market for these services, HCP will compare the cost of HCP clinics with those of private clinics and individual visits with specialty providers.

To keep pace with modern delivery systems, increase access to care, and further reduce costs, HCP will evaluate the telemedicine effort and consider how it might be expanded.

To create a system for tracking clinic utilization including dates of service, providers, utilization and payment sources. This will allow HCP to better document the value of the clinics and to manage scheduling more effectively.

Future Goals

To expand the telemedicine program to greatly increase the number of people who can be treated in remote areas of the state and reduce the need for them to travel to central locations.

To increase the types of specialties offered in the clinics and move toward a multi-specialty evaluation system. There is a need, especially in the rural areas, for additional specialty services. HCP would like to team approach that evaluates the whole child rather than evaluating each area individually.

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Finally, to improve quality and ongoing management, establish a year-end evaluation of clinic quality and outcomes.

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Additional Reports

Below are two additional reports. The first lists HCP clinics by location, counties served, and type of clinic. The second lists clinics not sponsored by HCP which serve the rural communities.

HCP Clinic

<i>Location</i>	<i>Counties Served</i>	<i>Type of Clinic</i>	<i>Provider Name</i>	<i>Frequency</i>
Alamosa	<i>Alamosa</i>			
	<i>Costilla</i>	Audiology	Taylor	2/year
	<i>Mineral</i>	Cardiology	Duster/Greensides	4/year
		Neurology	Reiley	4/year
		Orthopedics	Glancy	2/year
		Rehabilitation	Matthews	2/year
		Scolosis	Wyman	2/year
Cortez	<i>Dolores</i>			
	<i>La Plata</i>	Neurology	Nay	4/year
	<i>Montezuma</i>	Orthopedics	Wyman	2/year
		Rehabilitation	Wyman	2/year
Craig	<i>Moffat</i>			
	<i>Rio Blanco</i>	Neurology	Levishon	3/year
Durango	<i>La Plata</i>			
	<i>Montezuma</i>	Neurology	Nay	4/year
		Rehabilitation	Matthews	2/year
Glenwood Springs	<i>Garfield</i>	Cardiology	M Shafer	4/year
		Neurology	Nay	4/year

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HCP Clinic

<i>Location</i>	<i>Counties Served</i>	<i>Type of Clinic</i>	<i>Provider Name</i>	<i>Frequency</i>
Grand Junction	<i>Mesa</i>	Cardiology	M Shaffer/E Shaffer/ Wolfe	2/month
		Neurology	Reiley/Moe	8/year
		Rehabilitation	Stempian	4/year
Lamar	<i>Prowers</i>			
	<i>Bent</i>	Audiology	Einstein	2/year
		Neurology	Nay	4/year
Leadville	<i>Chaffee</i>			
	<i>Lake</i>	Neurology	Frenkel	4/year
	<i>Summit</i>			
Montrose	<i>Gunnison</i>			
	<i>Montrose</i>	Neurology	Seay	3/year
	<i>Ouray</i>	Rehabilitation	Matthews	4/year
		Orthopedics		4/year
Pagosa Springs	<i>La Plata</i>			
		Neurology	Nay	4/year
Springfield	<i>Baca</i>			
		Audiology	Cascade	2/year
Steamboat	<i>Grand</i>			
	<i>Routt</i>	Neurology	Levishon	3/year
Sterling	<i>Logan</i>			
		Neurology	Miller	4/year
		Orthopedics	Wilson/Chang/Georgopoulos	2/year

**Health Care Program for Children with Special Needs (HCP)
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Non-HCP Clinics

<i>County</i>	<i>Type of Clinic</i>	<i>Provider</i>	<i>Frequency</i>
<i>Baca</i>			
	Audiology (Typically for preschool children)	BOCES	
	Occupational Therapy	BOCES	
	Pulmonology	Pres St. Luke	monthly
	Speech Therapy	BOCES	
<i>Bent</i>			
	Audiology	Private	
	Orthodontist	Private	
	Orthotics/Prosthetics	Thornton Orthopedics	
<i>Elbert</i>			
	Pediatrics-Well Child	Public Health	4/year
<i>Fremont</i>			
	Neurology	Private	monthly
<i>Garfield</i>			
	Pulmonology	National Jewish	4/year
<i>Grand</i>			
	Pediatrics	Health One	monthly
<i>Gunnison</i>			
	Urology	Private	monthly
<i>Kiowa</i>			
	Audiology	BOCES	6/year
	Cardiology	Memorial Hospital	2/month
<i>Kit Carson</i>			
	Audiology	County Hospital	2/month
	Gastroentrologist	County Hospital	monthly
	Hearing Aid	County Hospital	3/month
	Orthopedic	County Hospital	4/month or weekly
	Orthotics/Prosthetics	County Hospital	2/month
	Pediatrics	County Hospital	2/month
<i>Mesa</i>			
	Genetics	TCH/UCHSC	6/year

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Non-HCP Clinics

<i>County</i>	<i>Type of Clinic</i>	<i>Provider</i>	<i>Frequency</i>
<i>Montrose</i>			
	Orthopedic	Montrose Hospital	
<i>Northeast-Logan, Morgan,</i>			
	Otolaryngologist	Private	monthly
<i>Prowers</i>			
	Audiology	BOCES	2/month
	Cardiology	Private	monthly
	Ophthalmology	Private	2/month
	Orthodontist	Private	4/month or weekly
	Orthopedics	Local Hospital	monthly
	Urology	Local Hospital	monthly
<i>Summit</i>			
	Psychiatry	Co. West Mental Health	monthly
<i>Weld</i>			
	Cardiology	TCH	4/year

FAMILY-CENTERED CARE

Background

In 1988, the Surgeon General, C. Everett Koop, MD, introduced the concept of family-centered care to guide programs serving children with special health care needs (Title V 42 U.S.C. 701.b.3). Family-centered care makes the family the primary consideration in the assessment and treatment of a child or adolescent and adapts services to accommodate the structures and values of families in the community being served (Johansen, A.; Starfield, B. & Harlow, J., 1994, Research Policy Brief). To accomplish this, programs must not only provide services, they must also perform an educational function to give families the information they need to make informed decisions about the child's care.

The Title V, Maternal and Child Health Program for Children with Special Needs created by this legislation is administered in Colorado through the Health Care Program for Children with Special Needs (HCP) located in the Department of Public Health and Environment. As a first step in providing family-centered care, HCP hired family members with children with special needs to advise in program development and work in the community. Individuals hired in this capacity assumed a variety of roles. At the statewide level, a mother who had experience with inclusive childcare settings developed an advisory board that included parents. This board was active for a short time, but was discontinued. Some communities hired family members as care coordinators to provide peer counseling and assist families in accessing. The Denver area organized a group of Spanish speaking families that is still active today. Over time, however, it became clear that these strategies were not accomplishing the goal of integrating the families into program planning and service delivery because the communities did not know how to engage the family members in this process.

In an effort to better understand the issues involved with integrating families into care delivery, HCP decided to survey both the HCP Regional Offices and the family members in the community. The first survey, distributed in 1997, asked the multidisciplinary teams in the 13 Regional Offices what they perceived to be the barriers to including family members in program planning and care delivery. The most common reasons listed were: limited funds to pay them; other demands on family member's time in caring for the child, and lack of child care services to support the parent while they worked.

The second survey, developed over the course of two years, was distributed in March 2000 to over 2000 individuals. This survey asked about family member's perception of the HCP program and gave them an opportunity to communicate what they would like in terms of additional services. About 45 percent of those surveyed responded.

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In general, family members were pleased to have their opinions solicited and they perceived the HCP staff to be caring, respectful and helpful. Other findings from the survey are described below.

Gaps and Barriers

A variety of unmet needs were identified. Some of them are directly health related while others involve the larger community. Direct service issues include the fact that HCP covers only certain diagnoses and families have difficulty financing care for the other, equally necessary services that HCP does not cover. There are also some services that are commonly unavailable. These include mental health programs, especially for children with developmental disabilities and transition services for adolescents moving into adult programs. There are also some rural communities where dental and orthodontic services are not available.

Another service issue is that many families feel that they are not given adequate information about the treatment being provided for their child. Some health care providers do not explain the purpose of the services they prescribe nor do they adequately explain the procedures the child is about to undergo. Parents would like to have a better understanding of the care their child is receiving.

Finally, families would like community programs that offer respite care, exercise and recreation. Financial assistance to cover the costs of these activities as well as transportation is also needed.

Current Successes

Over the last two years, family members have become more involved in the communities. All of the Regional Offices have a family member on staff to work with local multidisciplinary teams; in 1998 only five Regional Offices had family members on staff. The family/staff members have taken on many roles in their communities, such as advisory boards, task forces, care coordination and program development. They report being pleased with the contributions they have been able to make and Regional Office staff consider the family members to be an asset to their teams.

As a direct result of family participation, training programs have been developed to educate families about opportunities for personal development, handling medical complaints and other topics.

The survey also indicates that the medical care provided by physicians and Medicaid HMOs seem to meet the needs of families who qualify. Most HCP children have

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relatively short waiting times to see a physician and they are receiving services in primary care settings rather than emergency departments.

Current Plans

The first set of goals involves empowering parents to have more control of the treatment their child is receiving. Programs are being developed to help parents understand the needs of their child and introduce them to alternative treatments that might include natural settings and diverse methods of treatment. To support this, printed materials are needed to give parents a better understanding of the services available in the community.

Another step in empowerment will be to help families negotiate with insurance companies to assure that they get the services they are entitled. One aspect of this will be to develop stronger ties with the Patient Advocacy Coalition, an agency that assists families with issues related to insurance or meeting the medical needs of their child.

Other community efforts that will be undertaken include campaigns to make social services and physicians more aware of the issues surrounding families with children with special needs. There will be particular focus on the needs of adolescents and school-aged children and HCP will work with school districts to meet the educational and social needs of this population.

Finally, HCP will continue to develop the concept of family involvement in the Regional Offices. Advanced training will be provided for selected team members to help them with community organizing to obtain the services and recognition they need. HCP will also explore ways or provide a career ladder and sufficient funding to keep family members working locally.

MENTAL HEALTH AND DEVELOPMENTAL DISABILITIES

Background

HCP made a programmatic shift in 1996 from a centralized service delivery system to one that is multidisciplinary and locally directed. As regional offices began developing their multidisciplinary teams, the program administration decided that a social work position at the state level would be important in providing consultation to regional offices regarding mental health and child protection issues.

In 1997, a licensed clinical social worker was hired by HCP to address the psychiatric and developmental issues related to children with special health care needs. The position focuses on building community capacity and providing consultation for children with dual developmental and psychiatric diagnoses in the mental health and child protection systems. To better understand state needs in these areas, community mental health centers and county departments of human services throughout Colorado were surveyed to identify gaps in services and levels of expertise.

Gaps and Barriers

Gaps have been identified for the sub-population of children with special health care needs who also have developmental and/or psychiatric diagnoses. These gaps occur in the mental health, developmental disabilities, and child protection systems.

There are significant gaps when children have co-existing mental health and developmental diagnoses. The systems designed to meet the complex needs of these children are separate. Mental health clinicians often lack knowledge about developmental disabilities. Clinicians in the developmental disabilities system do not have psychiatric expertise. Thus, children with dual diagnoses present challenges, which exceed the capacity of either system alone. Unfortunately, there is no mechanism for formal collaboration between the systems. As a result, services for children with dual diagnoses are often fragmented.

The gaps in services for dually diagnosed children with special health care needs are further revealed when they enter the child protection system. Specialized foster care and

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adoption subsidy monies for these children are limited, respite care is even less available, and treatment options, as noted above, are at times virtually nonexistent.

Current Successes

Collaboration has begun in various settings across the state. Activities have included task forces, interagency meetings, and multi-agency “staffings” for children with dual diagnoses. There have also been requests for specialized training for mental health providers and human services personnel.

Eleven of thirteen HCP Regional Offices currently have social workers. Ten of these are part-time positions. The unique role of these social workers within the regional office teams is developing, and they are being used to enhance the overall service delivery program. All of these social workers are aware of the gaps across systems and are involved in efforts within their communities to address these gaps.

Mental health providers throughout the state are interested in addressing the needs of children with dual developmental and psychiatric diagnoses. Although the process for accomplishing this has not been fully defined, the desire to develop a more effective system exists at all levels from clinicians to administrators.

Current Plans

HCP will continue statewide efforts to support local communities working to improve services for children with dual developmental and mental health diagnoses. Activities will include participating in task forces and committees that address these issues. Additionally, efforts will be initiated to explore the complexities of protective service placement and permanency planning for children with special health care, developmental and psychiatric needs.

There have been on-going partnerships between HCP state office personnel and the Colorado University Affiliated Program (JFK Partners). This collaboration has supported the needs assessment efforts with respect to the mental health, developmental disabilities, and human service systems. This and other collaborative efforts will continue as the gaps in service delivery for children with special health care needs are addressed.

Future Goals

The long-term goal is to develop a “seamless” system of care for children with special health care, developmental, and psychiatric needs. Such a system would provide high quality, family-centered care without regard for funding sources or agency constraints. To accomplish this, it will be necessary to develop a better understanding of the clinical and systems issues that impede cooperation, so that these obstacles can be removed, and effective and competent service delivery can occur.

MULTI-DISCIPLINARY TEAMS

Background

In 1996, HCP decentralized administration to 13 Regional Offices and implemented a multi-disciplinary team approach to service delivery. At the same time, HCP shifted its primary emphasis from intermediary for paid services to care coordinator and quality assurance manager. It took nearly three years to make the transition and hire the part-time discipline consultants who participate on each team. Since then, the Regional Offices have been adjusting to their new roles, responsibilities, and staffing patterns.

The multi-disciplinary teams in each region include a nurse, nutritionist, occupational/physical therapist, speech therapist, social worker, and hearing professionals. In addition, teams include family/parent representatives, resource coordinators and other administrative staff. These teams work together to plan care for HCP eligible children, coordinate benefits between HMOs and other sources of payment including HCP, and develop the infrastructure to access and coordinate services across the many agencies in the community. The teams also help administer limited HCP paid services for children who qualify for HCP and have no other sources of health care coverage.

Gaps and Barriers

Although the multi-disciplinary teams have been in place for several years, most continue to struggle internally with role definitions for team members and externally with their roles and functions in the community. The 13 Regional Offices differ in their definition of “core team” and their use of the discipline Regional Coordinators. In some cases, discipline Coordinators are considered part of the “core team” and participate fully in case management, while in others, the disciplines are considered to be consultants who are brought in for advice on a more or less ad hoc basis. Although there is some room for diversity in team organization and administration, the Regional Offices themselves perceive that they need better role definition and integration.

Current Successes

Four offices, Boulder, Weld, Pueblo and Western Slope, appear to be very comfortable with their teams and their functions, and all the Regional Offices report satisfaction with the team approach, and feel that their members are competent, dedicated and committed.

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Several counties have begun developing community systems using parents, occupational and physical therapy coordinators, speech coordinators, and coordinators from the Newborn Hearing System.

Role definitions appear to be most clear in the area of direct services, the area most familiar to many of the participants. In addition to coordinating paid services, many Regional Coordinators, especially the physical therapists and nutritionists, attend clinics and participate in treatment planning for the children who attend.

Current Plans

Role definition is the top priority for the multi-disciplinary teams. Nine of the thirteen Regional Offices listed this as a priority in their annual reports.

All the Regional Offices should also be participating in the Newborn Hearing System. The relationships between the Audiology Regional Coordinators, the Colorado Hearing Resource Coordinators, and the multi-disciplinary teams need to be strengthened.

Future Goals

To have 13 well functioning, multi-disciplinary teams in which all participants feel that they are valued members who participate fully in the treatment plans and care coordination of the children they serve.

COLORADO NEWBORN HEARING SYSTEM

Background

In May 1997, the Colorado Legislature passed House Bill 97-1095 requiring hospitals to implement newborn hearing screening programs. The program was implemented gradually with a goal that by July 1, 1999, 85 percent of the births in Colorado would have hearing tests before leaving the hospital. Colorado achieved this goal and currently screens 85 percent of the babies born here.

As part of the same bill, the Legislature also created the Colorado Infant Hearing Advisory Committee consisting of health department personnel, audiologists, parents, consumers who are deaf and hard of hearing, and representatives from other state agencies such as the Department of Education and Medicaid. The Advisory Committee has been instrumental in defining the needs and goals as the state develops a comprehensive system. Within the Advisory Committee, there are four task forces: screening, audiologic assessment and amplification, early intervention, and medical follow-up. These task forces have written guidelines for screening that have been approved by the Advisory Committee and can be found at the following web address: www.colorado.edu/slhs/mdnc/guidelines.html

Gaps and Barriers

The number one concern of the Colorado Infant Hearing Advisory Committee is that many of the children who are identified as possibly being deaf or hard of hearing in the newborn screen do not return for follow-up after discharge from the hospital. One reason for the poor return rate may be that the results of the screen are not available before the child is discharged from the hospital so the family may not get the information. Another possible explanation is that the family follows up, but the information is not reported back to the program. Steps are being taken to improve reporting of results and tracking follow-up care.

A second issue, ironically, comes from the success of the program. Current staffing levels are not sufficient to keep up with the needs generated by this successful screening system. As an increasing number of children are identified, more children need early intervention. In addition, increased time for service coordination is needed. Service coordination is provided by Colorado Hearing Resource (CO-Hear) Coordinators. These coordinators assure that children with an identified hearing loss have access to early intervention programs.

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There are also problems with obtaining follow-up diagnoses and amplification. The first issue in this category is access to qualified audiologists. Currently, there are a limited number of audiologists with expertise in pediatric assessment and amplification. As a result, some areas in the state do not have an audiologist qualified to make a pediatric assessment so families must travel long distances for an evaluation.

A second issue with follow-up and intervention is funding. The shortage of qualified audiologists means that many of the HMO networks do not have pediatric audiology experts under contract. Since HMOs often refuse to pay for evaluations by providers that are not in the network, timely follow-up can be a problem. In addition, access to Child Health Plan Plus (CHP+) has been a challenge, and funding from Early Childhood Connections (Part C) is not available in all counties. Although the Colorado School for the Deaf and Blind has filled gaps to pay for some services, covering costs remains a challenge. In an effort to address some of these issues, the Colorado Legislature passed a bill to cover therapeutic intervention, but the effects of this have not been realized. A chart listing funding sources for early intervention services is attached.

Current Successes

Education is critical to the success of the Newborn Hearing System. Materials with recommendations for follow-up are being distributed to Primary Care Physicians (PCP's) and otolaryngologists, and a new brochure for families has been developed with partial funding by the Colorado Hearing Foundation and the March of Dimes. The brochure explains the hearing screening process, lists resources for following up if a child is referred on the screening test, and addresses the importance of early identification and intervention of hearing loss.

Although the brochure will be translated into Spanish, it is recognized that written material may not be read. Thus, the material will be communicated to the family in their native language when the brochure is given to them. There will also be a program to educate midwives who assist in home births so that they can provide families with information about getting the newborn hearing screen on an outpatient basis.

The entry point from diagnosis to early intervention is through the CO-Hear Coordinator. The recommended process is that the audiologist who makes the diagnosis refers the family to the Regional CO-Hear Coordinator, and the CO-Hear Coordinator meets with the family to discuss options for language development, early intervention and funding resources. The CO-Hear Coordinator also assures that the family has access to all agencies serving children birth to three years of age (e.g. Part C, Child Find).

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In an effort to establish standards of care throughout the state, the Early Intervention Task Force of the Colorado Infant Hearing Advisory Committee is developing a list of competencies, including requisite knowledge and skills, for providers.

Current Plans

To address the low rate of follow-up for children identified in the newborn hearing screen, the program is developing a data management system based on the electronic birth certificate to transmit test results electronically to the hospital. This system will assure that results arrive before discharge.

Another target for improvement is to clearly define the process for obtaining follow-up reports from providers who may have evaluated the baby's hearing following discharge. HCP currently has Audiology Regional Coordinators assigned to each of the 13 Regional Offices. These Coordinators are responsible for assuring that children who fail a newborn hearing screen have access to testing. As part of this coordinating function, they meet with stakeholders in each community to develop a protocol for follow-up for nursery staff, Primary Care Physicians, and audiologists. To support this follow-up process, the Newborn Hearing Data Management System will be integrated with the data system used for Genetic Screening. Both systems strive to identify the Primary Care Physician/medical home of each child and this information will greatly facilitate communication. Additional data elements identifying the age a hearing loss was diagnosed, and the age at which a child started early intervention will be included in the Newborn Hearing Data Management System. This information will enable the Newborn Hearing Screening System to monitor effectiveness over time and identify areas needing improvement.

There are also plans for education programs to provide audiologists with the skills that they need to make pediatric assessments and fit amplification devices. Also, in an effort to identify additional resources, the Colorado Infant Hearing Advisory Committee is planning a survey to identify audiologists in the state that have the equipment and expertise recommended in the Guidelines. It is anticipated that this survey will identify additional qualified providers who can take referrals.

Colorado Newborn Hearing System staff are also working to identify other resources, such as service organizations, to cover the costs of amplification. Staff are also meeting with the HMOs to address the need for follow-up by pediatric experts.

The program is exploring the possibility of moving from contractual arrangements to full time positions for providers and CO-Hear Coordinators. The Colorado Home Intervention Program (CHIP) contracts with over 100 providers to deliver early intervention to approximately 150 families. While many of these providers have been

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with the program for more than 10 years, the program has added more than 20 new providers in the last 2 years. It is also difficult for the current staff of contracted CO-Hear Coordinators to keep up with the volume of families identified for follow-up and early intervention. With the increasing population of deaf and hard of hearing infants and toddlers, it would be more cost effective to staff these as salaried positions. This is being explored through several agencies including HCP, the University of Colorado-Boulder, and the Colorado School for the Deaf and Blind.

Finally, a major goal for next year is that all families receive diagnostic information and recommendations in their native language. Trained parents located in specific geographic regions of the state will offer some of this information.

Future Plans

To develop a coordinated system of screening, follow-up and intervention that provides cost-effective, culturally appropriate hearing services to the children living in Colorado.

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FUNDING SOURCES FOR EARLY INTERVENTION FOR HEARING LOSS

AGENCY	SERVICES	SERVICE DELIVERY	REGION SERVED	ACCESS	CONTACT
Medicaid	Funding for intervention by specialist in hearing loss Funding for intervention by other specialist Funding for amplification (Limited) case management	Home-based or clinic-based	Statewide	County Social Services Office or local satellite eligibility	Colorado Hearing Services Coordinator (CO-Hear)
Health Care Program for Children with Special Needs (HCP)	Funding for intervention by specialist in hearing loss Funding for sign language by specialist in sign language Funding for intervention by other specialist Funding for amplification Case management/Care Coordination Parent Advocacy (specialized for hearing loss) Deaf/Hoh adult role models (Limited) funding for assistive technology	Home-based or clinic-based	Statewide	HCP Regional Offices Determination site	Colorado Hearing Services Coordinator (CO-Hear)
Private Insurance	(Possible) funding for intervention by specialist in hearing loss (Possible) funding for intervention by other specialist (Possible) funding for amplification (Limited) funding for assistive technology	Home-based or clinic-based	Individual policy dictates	Health Insurance Carrier	Health Insurance Carrier
Child Health Plan Plus (CHP+)	Funding for intervention by specialist in hearing loss Funding for intervention by other specialist Funding for amplification (Possible) funding for assistive technology	Home-based or clinic-based	Statewide	Local satellite Eligibility Determination (SED) site or county social services office	Colorado Hearing Services Coordinator (CO-Hear)
Local Community Center Boards (CCB)	Case management (Possible) funding for intervention by specialist in hearing loss (Possible) funding for sign language instruction by specialist in sign language Funding for intervention by other specialist (Supplemental) funding for assistive technology Parent support (non-categorical)	Home-based or clinic-based	County	County Community Center Board (CCB)	Colorado Hearing Services Coordinator (CO-Hear)

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AGENCY	SERVICES	SERVICE DELIVERY	REGION SERVED	ACCESS	CONTACT
Service Organizations	(Possible) funding for intervention by specialist in hearing loss (Possible) funding for sign language instruction by specialist in sign language (Possible) funding for intervention by other specialist (Possible) funding for amplification (Possible) funding for assistive technology	Home-based or clinic-based	Community	Individual service organizations	Colorado Hearing Services Coordinator (CO-Hear)
County Part C	(Possible) funding for intervention by specialist in hearing loss (Possible) funding for sign language instruction by specialist in sign language (Possible) funding for intervention by other specialist (Possible & partial) funding for amplification (Possible & partial) funding for assistive technology Service coordination Parent Support (non-categorical)	Home-based / natural environment	County	Part C Service Coordinator	Colorado Hearing Services Coordinator (CO-Hear)
Colorado School for the Deaf and Blind (CSDB)	Funding for intervention by specialist in hearing loss Funding for sign language instruction by specialist in sign language	Home-based	Statewide	Colorado Hearing Services Coordinator	Colorado Hearing Services Coordinator (CO-Hear)

NUTRITION SERVICES

Background

Through a Maternal and Child Health SPRANS Grant (1989-1992) it was determined that approximately half of the children eligible for HCP have nutrition-related issues. To address these needs, HCP currently reimburses nutrition services for the children that qualify for HCP paid services. The staff dietitians in the HCP Regional Offices provide unlimited contacts including home visits, assessment, care coordination and follow-up. Contract dietitians in the more rural areas are reimbursed for three visits including a home visit and a staffing with other providers/agencies as needed. The WIC program also assists many children birth to age five with special formulas as well as nutrition education and high-risk counseling and referrals.

Unfortunately, however, there is little support for nutritional services outside these health department programs. Few private insurance plans cover nutrition services or the special formulas that are often needed to correct nutritional deficiencies. When coverage is available, usually only for diabetes or obesity, it is limited to outpatient visits only.

Public health insurance plans, such as Child Health Plan Plus (CHP+) or Medicaid, provide limited coverage that is often fragmented and difficult to access. Although CHP+ offers limited nutrition benefits including special formulas, and Medicaid covers services and formulas if services are delivered by a physician, these services are not required in the contracts with the HMOs, where most of the children that qualify for these plans are enrolled. Consequently, services are not usually available and most HMOs do not even have Registered Dietitians or dietitians with pediatric experience.

In addition, other agencies that might address nutritional issues do not. Part C Early Intervention for children birth to three years of age is administered through the Department of Education, but nutrition is rarely included in Individual Family Service Plans (IFSPs) and nutrition and feeding issues are seldom covered in Individual Education Plans (IEPs) in Part B Special Education. One reason for this lack of attention to nutritional issues is that most school districts do not have Registered Dietitians available for Part B Special Education.

These conditions largely mirror the state's priority for nutrition. Registered Dietitians are not licensed in Colorado; they are registered instead through a national program, the American Dietetic Association. Colorado legislators have not seen that licensing this profession would benefit to the consumer and general public.

Gaps and Barriers

As noted above, there is little support for nutrition services outside the health department. The vast majority of HMOs do not have nutrition providers or nutrition programs and collaboration with the Department of Education's Early Intervention and Special Education programs is limited. In addition, Part C is phasing out payment for direct service.

Another difficulty has been developing nutrition referral programs for children discharged into the community from Neonatal Intensive Care Units (NICUs). One reason for this lack of coordination is that HCP dietitians are not trained in neonatal nutrition follow-up.

Gaps also continue for children who are undocumented. There is no source of reimbursement for special formulas after they reach the age of five and are no longer eligible for WIC.

Provider reimbursement is also an issue. Many nutrition providers must travel long distances to provide consultation. Although they are reimbursed for the visit, they are not compensated for travel time. The reimbursement process is also cumbersome. Third party claims processing is very slow and when claims are denied, the provider must submit a second claim to HCP. Some providers have refused to take referrals unless they are covered by HCP because the reimbursement from other sources is slow and complicated.

Current Successes

Nutrition screening is currently a part of the HCP application in most Regional Offices. The screening tool is also becoming a part of the renewal process for yearly screenings. To serve children identified in this process, there are nine Regional Coordinators for nutrition who work with ten providers to perform assessment, counseling and follow-up for children with nutrition needs. These providers also function as a resource for nutrition technical assistance in the HCP Regional Offices.

Collaborative efforts are increasing as the regional coordinators and providers become better integrated into the community. There is an HCP Nutrition Advisory Committee with representatives from many agencies who work together for a more coordinated system of nutrition services. HCP also has strengthened its association with The Children's Hospital, JFK Partners (an agency that provides services for people with developmental disabilities), and the WIC program and provides consultation to these organizations regarding children with special needs. Finally, HCP has developed training programs for HCP providers and dietitians from other agencies, and has collaborated on nutrition video conferencing with the University of Colorado School of Nursing.

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The Department of Education is also developing better nutrition resources. Part C has a small grant with Jefferson County for a dietitian to see children from birth to three years of age and Boulder County Part C has agreed to limited reimbursement for nutritional services.

HCP has also been able to purchase resources and equipment for HCP providers to use in local communities. These items include scales, skinfold calipers to measure body fat, plastic food models to demonstrate portion sizes, infant feeding equipment, nutrition assessment software, length boards to measure height for children who cannot stand and various text books, reference materials, and educational handouts. These resources are shared with the multi-disciplinary staff in the Regional Offices, Health Departments and County Nursing Offices.

HCP was able to provide limited special formulas during a pilot program in 1998. Although the program only added new children for six months, three of these children, who had no other options because they were undocumented, have continued to receive assistance.

Current Plans

Breast pumps, collection kits and supplemental nursing systems are being purchased for local communities to support breast feeding for children with special needs including infants discharged from NICUs.

HCP is exploring the feasibility of reimbursing for special formulas and nutrition supplements for children without other resources.

Future Goals

Continue to improve collaboration with CHP+, Medicaid, and the Department of Education.

Improve nutrition follow-up for infants discharged from NICU.

Evaluate the possibility of increasing HCP rates for nutrition providers.

Explore ways of facilitating third party reimbursement and the provider application process.

OCCUPATIONAL THERAPY, PHYSICAL THERAPY (OT/PT) AND DURABLE MEDICAL EQUIPMENT (DME)

Background

Occupational and physical therapy (OT/PT) services include direct therapeutic intervention by providers who have been credentialed and contracted by HCP. Although HCP is moving away from the role of direct service provider, the program continues to pay for occupational therapy, physical therapy and durable medical equipment for children who have no other source of insurance or whose insurance does not cover the cost of the services they need. HCP also provides occupational and physical therapy (OT/PT) to Medicaid-eligible children with special health care needs in areas of the state where there is no Medicaid-eligible OT/PT provider. In these cases, HCP provides the service then bills Medicaid for reimbursement.

While many of the children served by HCP have other insurance, these plans rarely cover the number of therapy visits required by a child with special health care needs. HCP's role in these cases is to provide "wrap-around" coverage to pay for services when the insurance benefit is expended.

HCP's role in the purchase of Durable Medical Equipment (DME) increases each year as the cost of DME goes up and the insurance coverage to pay for it goes down. DME for children with special health care needs is expensive because it requires substantial technology and is often produced individually for each child. Currently, a power wheelchair with special seating can cost anywhere from \$12,000-\$20,000 or more, while a manual wheelchair with special seating can cost from \$4,000-\$8,000. HCP also funds many other pieces of equipment such as walkers, gait trainers, orthotics and prostheses. These items can be very costly as well. The cost of a single ankle-foot orthotic ranges from \$500-\$1,600 and a lower extremity prosthesis can cost from \$9,000-\$15,000 or more.

Gaps and Barriers

Medicaid requires that OT/PT services be provided in a facility with a physician "on-site". In the rural areas, there are few therapy providers with pediatric expertise and even fewer physicians who treat children with special health care needs. As a result, many areas of the state have no Medicaid-eligible OT/PT provider because a physician is not available.

Also in these rural areas, where people may need to travel long distances to get to a facility, many therapists prefer to work with the children and their families at their home in a natural setting. The Medicaid "on-site" rule does not allow this to happen.

Another gap in therapy services occurs when no OT/PT provider in the area is contracted with the HMO where the child is enrolled. In these cases, if a contractual arrangement between the

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HMO and a local provider cannot be negotiated, HCP must pay for services or have the child leave the area for care.

The fact that most insurance plans do not begin to cover the cost of DME for a child with special health care needs is a mounting problem. Child Health Plan Plus (CHP+), a major insurer of special needs children, pays a maximum of \$2,000 per year for DME; Blue Cross/Blue Shield generally pays 70 percent of a DME purchase. If the average cost of a non-motorized wheel chair with special seating were \$6,000, a family would be responsible for \$1,800 to \$4,000, depending on the insurance plan. This amount of money is unthinkable for the low-income families who qualify for these plans.

There also continues to be a core of families in the state for whom HCP is the only source of coverage. Many of these children have ongoing DME needs secondary to severe physical disabilities and HCP covers the costs.

Current Successes

HCP increased OT/PT reimbursement rates in July 1999 making them more comparable to Medicaid rates. In addition, several new services were added to the HCP list: services in community/natural environments, orthotics fitting, upper and lower extremity splinting and casting, and attendance and participation in Individual Family Service Planning and Individual Education Planning (IFSP/IEP) meetings.

All HCP Regional Offices have OT/PT coordinators who provide technical assistance, build community capacity, and fulfill certain administrative tasks associated with OT/PT services and the purchase of DME. The coordinators also assist the Regional Offices and families in identifying providers in the community and monitor direct services by reviewing the treatment plan submitted by the therapist.

Despite the increased demand for “wrap-around” coverage, during the past year HCP has been able to fund all DME requests that meet HCP criteria: it is on the HCP allowable list, it is medically necessary, and the child is HCP eligible.

Current Plans

Plans for the future include adding new OT/PT providers in several under-served rural areas, working with Medicaid to change the Physician “on-site” rule, adjusting provider reimbursement rates as necessary to keep them comparable with Medicaid, and using the new patient registration system (IRIS) to more closely monitor direct services.

**Health Care Program for Children with Special Needs (HCP)
Needs Assessment Summary – May 2000**

HCP plans to continue coverage of medically necessary DME when there is no other funding source and the child is HCP eligible. HCP will also continue to provide “wrap-around” coverage for HCP eligible children when other insurance does not cover the cost.

Future Goals

To provide OT/PT services as needed in appropriate sites throughout the state and assure that the quality of services delivered is consistently high regardless of whether the child is located in a rural or an urban community.

HCP also plans to continue to provide modern durable medical equipment that is medically necessary and appropriate for the needs of the child.

VISION PROJECT

Background

There is a lack of vision screening for young children throughout the country even though modern technology makes such evaluations possible. When a needs assessment confirmed the lack of screening for children six months to five years of age in Colorado, steps were taken to address the issue. Equipment has been purchased, screening guidelines have been developed and programs have been implemented in five rural and urban sites across Colorado.

Gaps and Barriers

Because the vision screening technology is relatively complex, a trained reader must interpret results. Since this is relatively new technology, the skills of these readers are highly variable.

The program is further hampered by the lack of a uniform program of follow-up when a problem is identified. Protocols for communication of results and follow-up need to be developed.

Currently, there is no funding to pay screeners and other participants. Some HCP regional offices would like additional funding to cover the costs of providing these services.

Current Successes

The program has gotten off to a good start. Preserve Site America has trained 5 people in the state, free of charge, to read the photographs for the Vision Photoscreener and make evaluations. School Health Corporation's regional representative has trained an additional 20 people. To assure consistency, a manual, Colorado Guidelines for Screening was created.

Approximately 300 children have been screened in the program. In the early stages of evaluating the project, a population of 70 children with special needs was screened and four children were identified as having vision deficiencies that had not been detected previously.

The program has served as a catalyst for interagency cooperation. Partnerships are being formed between HCP and the school agencies in the five areas to share the camera and the screening procedure. The Colorado Lions Club has also indicated an interest in partnering with HCP.

Finally, SPSS, a statistical package, was purchased to analyze the data from the protocols.

Current Plans

HCP has communicated with the Vision Screening Project at Vanderbilt University in Tennessee to share experiences and techniques. This dialogue will continue.

To improve evaluation and follow-up, temporary follow-up plans will be implemented in each pilot site. The plans will then be monitored for effectiveness and modified as needed.

HCP will follow-up on the potential partnership with the Lion's Club. A presentation is scheduled for the northeast regional meeting, and HCP will work with other partners in the project to develop a grant proposal for the National Lion's Club.

Although substantial screening data has been collected from the sites, it has not been analyzed. Examining these results from the screening program is a major priority.

Future Goals

To facilitate evaluation and improve accuracy, HCP will investigate the new cameras that print out pass/fail evaluation results.

HCP will use information from the screening results plus its experience with the temporary follow-up plans to develop a formal follow-up program.

When data have been collected and analyzed, vision project staff will present results to the HCP central Office and to the Directors of Speech and Hearing Programs in State Health and Welfare Agencies (DSHPWA).

As part of an ongoing quality assurance effort, HCP will continue to gather and analyze utilization data from the vision program.

Title V Block Grant Funding Methodology Description Colorado Department of Public Health & Environment

Background

A task force was brought together by the Family and Community Health Services Division, Colorado Department of Public Health & Environment, in November 1998 to develop an equitable funding allocation methodology for the distribution of Maternal and Child Health Title V Block Grant funds. The task force included representatives from local health departments, county nursing services, and advisory councils and was also asked to recommend reshaping the contracting process. The task forces met monthly for six months, considering many issues involved in the proposed changes. A final methodology was decided in August 1999.

Funding Methodology

Total Funding Available

The total amount of funds available to local agencies is to be divided into two pots, one for organized health departments, and one for local nursing services, in the same split as the funds had been previously divided. The organized health department pot contains about two-thirds of the funding, and the local nursing services contains about one-third. There are fourteen organized health departments in Colorado and 39 nursing services; the organized health departments, with a few exceptions, are in heavily populated urban areas; the nursing services serve rural and frontier counties with small populations.

Prior to the division of funds into two pots, some money is retained as a set-aside which is distributed to applicants to address specific needs or issues. A three-year commitment to adolescent and school-based health projects through FY 01 is the current area where these funds are focused.

It should also be noted that this funding methodology is not yet being used to distribute funds for children with special health care needs, but that funds will be distributed in a parallel funding formula methodology using factors specific to children with special health care needs beginning with the FY 01 year.

Funding Distribution Theory

The essence of the funding methodology is that each health entity merits a proportion of the total funds, where the proportion is based on the size of the county compared to all the counties, as measured by a factor or factors. If there are 6 counties, for example, and one contains half the population, and the other five counties each contain 10 percent of the population, and population is the only factor under consideration, then the large county would receive half the available funds, and the other five counties would each receive 10 percent of the funds.

Factors

After consideration of a number of variables, four factors were chosen on which to base funding for each county: the total number of children under the age of 18; the total number of women age 15 to 44; the total number of children under 18 who are also below 200 percent of the federal poverty level; and the total number of women 20 to 44 who are also below 185 percent of the federal poverty level. The most recent data available will be used for a final calculation of the distribution. At this time, the data sources for population are the Colorado Department of Local Affairs, Division of Local Government, Demography Section estimates for 2001. The estimate of low-income population is from the 1990 Census for children under 18 and applied to the 2001 population estimate. The estimate of low-income women of reproductive age is from a special run for Colorado, "Contraceptive Needs and Services, 1995," done by the Alan Guttmacher Institute in 1998, and available for each county.

Weights

In this proposal, four factors have been chosen. However, the task force did not want each factor to have equal weight (25 percent each). The committee proposed giving more weight to the low-income population factors than to the total population factors, but the final weights have not yet been decided. One distribution under consideration was:

	<u>Weight</u>
1. Total number of children under 18:	1/6 = 16.6%
2. Total number of women 15-44:	1/6 = 16.6%
3. Children under 18 and below 200% poverty:	1/3 = 33.3%
4. Women 20-44 and below 185% poverty:	1/3 = <u>33.3%</u>
	100.0%

Under this setup, the low-income factors have double the weight of the population factors.

As an example, assume that County A has 5 percent of all the children in counties served by local nursing services; 4 percent of all the women of childbearing age; 6 percent of all low-income children, and 7 percent of all low-income women.

Without any weighting, County A should receive ((5%*25%) + (4%*25%) + (6%*25%) + (7%*25%)) of the funding available, or 5.5% of all the available funds for local nursing services.

With weighting, County A should receive ((5%*16.6%) + (4%*16.6%) + (6%* 33.3%) + (7%* 33.3%)) of the funding, or 5.83% of all available funds.

With weighting, County A gets a slightly higher proportion of all the funds available because it has higher proportions of low-income children and low-income women than it does of all children and all women, and the formula favors the two low-income factors over the two general population factors.

Results

When the formula using four factors weighted as described above is applied to Colorado's 39 local nursing services, the smallest proportion of funds allocated to any one county is 0.2

percent of all available funds, and the largest proportion is 8.9 percent. There are 18 small counties each expected to receive about 1 percent of the funds, six counties each to receive about 2 percent of the funds, seven counties each to receive about 3 percent of the funds, four counties to receive about 4 percent of the funds, and five counties to receive at least 5 percent of the funds. A minimum dollar figure (\$6,000) was established as a base dollar amount; seven counties due to receive less than that figure, based on their proportionate share of funds, will instead receive the minimum.

For the organized health departments, the smallest proportion is 0.9 percent, and the largest is 22.6 percent. Four small health departments expect to receive about one percent of the funds, two are to each receive 2 to 4 percent of the funds, four are to each receive 5 to 9 percent of the funds, one is to receive about 10 percent of the funds, two to receive between 15 and 19 percent, and one to receive over 20 percent.

Historical Comparison

The application of the formula to the available funds in each of the two major categories results in a specific dollar amount for each county. Of paramount interest to each county was the difference between the new funding amount and the previous funding amount, which had initially been based on full-time equivalency positions in maternal and child health.

The application of the formula results in about half the county nursing services receiving increases and half facing decreases. The application of the formula also results in increases for seven organized health departments and decreases for seven. Some of the amounts involved are large enough to cause problems either in growth or downsizing.

These large changes suggested that a phase-in approach might be most helpful for the agencies, so that there would not be large changes in the contract amounts after the formula is adopted.

Phase-in

The funding methodology will be phased in over a three-year period. Twenty percent of the change will occur in year 1; an additional 40 percent in year 2; and the remainder in year 3. Contracts for the local nursing services will be generated according to the formula beginning October, 2000, while contracts for the organized health departments will begin July, 2000.

Family and Community Health Services Division
Colorado Department of Public Health & Environment
April 9, 2000

Workshops and Training Sessions Conducted or Sponsored by HCP During FY 99, Partial Listing

VISION: DIAGNOSTIC ISSUES, DEVELOPMENTAL ISSUES, and GENETIC ISSUES

Faculty: Bronwyn Bateman, M.D., Professor and Chair: Department of Ophthalmology, school of Medicine, University of Colorado and Bonnie Utley, Ph.D., University of Colorado at Denver, Special Education Department

BEHAVORAL ISSUES: DIFFERENTIAL DIAGNOSIS/INTERVENTIONS

Faculty: Jennifer Hills, Ph.D., The Children's Hospital, Child Development Unit

DIAGNOSING ATTENTION DEFICIT DISORDER/ATTENTION DEFICIT HYPERACTIVITY DISORDER

Faculty: James Ledbetter, M.D., Neurodevelopmental Pediatrician, Medical Center of Aurora

PUTTING PARENT/PROFESSIONAL PARTNERSHIPS IN ACTION

Presenter: Carolyn Harris, Family Consultant, Health Care Program for Children with Special Needs

CLINIC MANAGEMENT AND FOLLOW-UP FOR CLEFT LIP/CLEFT PALATE

Faculty: Jeff Stephan, M.S., The Children's Hospital Cleft Palate Team

TRAUMATIC BRAIN INJURY

Presenter: Jean Dise-Lewis, Ph.D., The Children's Hospital, Child Development Unit

DEVELOPMENTALLY SUPPORTIVE CARE BY NURSES

Presenter: Joy Browne, Ph.D., The Children's Hospital, Neonatal Developmental Specialist

SENSORY INTEGRATION: DIFFERENTIAL DIAGNOSIS AND TREATMENT TECHNIQUES

Presenter: Lucy Miller, Ph.D., University of Colorado Health Sciences Center

NEWBORN HEARING SYSTEMS

Faculty: Arlene Stredler Brown, M.S., Vickie Thomson, M.S., and Christie Itano, Ph.D., Marion Down National Center for Infant Hearing, University of Colorado at Boulder

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*Tipping the Scales:
Weighing in on Solutions to the
Low Birth Weight Problem in Colorado*

Family and Community Health Services Division
Health Statistics and Vital Records Division
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, Colorado 80246

June 30, 2000

This report is available after August 15, 2000 in PDF format at
<http://www.cdphe.state.co.us/fc/lbwreport.asp>

Highlights

- **Colorado has one of the highest low birth weight rates in the nation.** In 1997, the state's low birth weight rate was 8.9 percent, with over 5,000 babies born low birth weight. The Healthy People goal for the nation for the year 2000/2010 is 5.0 percent.
- **The major contributing factors to low birth weight in Colorado (based on 1995-1997 birth certificate data) are multiple births, inadequate maternal weight gain, smoking, and premature rupture of the membranes.**
- **Multiple births are a large contributor to Colorado's low birth weight problem: one out of every five low weight births is a multiple.** If the state's multiple rates could be reduced to a naturally occurring level (eliminating multiple gestations resulting from assisted reproduction), there would be a decline of about half a percentage point in the state's overall low birth weight rate (based on 1995-1997 data).
- **Inadequate maternal weight gain during pregnancy is the largest contributor to the number of *singleton* low weight births.** If this problem were completely eliminated, the low birth weight rate for singleton births would be reduced by 12.8 percent, from 7.1 percent to 6.2 percent, a decline of nearly one percentage point.
- **Smoking among pregnant women is a significant contributor to Colorado's low birth weight problem.** If all pregnant women were nonsmokers or quit smoking during pregnancy, Colorado's singleton low birth weight rate would be reduced by 11.9 percent, resulting in a drop from 7.1 percent to 6.2 percent.
- **Premature rupture of the membranes is another significant contributor to Colorado's low birth weight problem.** If this problem could be eliminated, the low birth weight rate for singleton births would be reduced by 9.1 percent, from 7.1 percent to 6.5 percent.
- **Colorado's singleton low birth weight rate could be reduced by one-third, and the overall state low birth weight rate by one-quarter, if all pregnant women gained weight adequately and no pregnant women smoked.** If these conditions had been met for the 1995-1997 period, the state low birth weight rate would have been reduced from 8.7 percent to 6.4 percent.
- **The prevalence of each of the four most important risk factors can be reduced.**
 - Multiple gestation can be decreased by reducing the number of multiple gestations resulting from assisted reproduction;
 - Inadequate weight gain can be reduced by assuring that all women have appropriate nutrition counseling and gain an adequate amount of weight;
 - Smoking among pregnant women can be reduced by assisting all women to be smoke-free prior to conception or to quit smoking early in pregnancy; and
 - Premature rupture of the membranes can be reduced by ensuring that all women at risk for lower genital tract infections are screened and treated early in pregnancy, and by increasing client awareness of signs and symptoms of preterm labor.

Executive Summary

Colorado has one of the highest low birth weight rates in the nation. Low birth weight is a significant health problem that contributes to infant mortality and to developmental and neurological disability. In 1997, the state's low birth weight rate was 8.9 percent, with over 5,000 babies born low birth weight (5 pounds, 8 ounces or less, or less than 2,500 grams). The Healthy People goal for the nation for the year 2000/2010 is 5.0 percent.

In 1998, the Colorado Department of Public Health and Environment conducted a multiple regression analysis of low weight births in an attempt to further quantify the problem of low birth weight. Eighteen factors captured on the birth certificate were determined to be closely associated with low birth weight. The most important factors included premature rupture of the membranes, poor maternal weight gain, pregnancy-associated hypertension and/or eclampsia, maternal smoking, abruptio placenta, previous preterm or small for gestational age birth, hydramnios/oligohydramnios, and black race. In 1999 the Department conducted a follow-up study to determine which of these factors were associated with the greatest number of low weight births. Population attributable risks were calculated to address this question.

Population attributable risk is a statistical measure that combines the prevalence of a condition in a population (e.g., what percent of women smoke) with the severity of that condition (smoking doubles the risk of low birth weight) to yield a percentage of the total (low birth weight) rate which is "attributable" to the condition in that population. Four factors were found to have high population attributable risks: multiple births, inadequate maternal weight gain during pregnancy, smoking during pregnancy, and premature rupture of the membranes.

Multiple births are a large contributor to Colorado's low birth weight problem, accounting for one out of every five low weight births. If the causes of low birth weight among multiple gestations could be eliminated, and multiple births were no more likely than singleton births to be low weight, the state's low birth weight rate would be reduced by 19.9 percent, from 8.7 percent in 1995-1997, to 7.1 percent. However, if the state's multiple rate could be reduced to a naturally occurring level, eliminating just the multiple gestations resulting from assisted reproduction, without a change in the low birth weight rate among twins and higher order multiples, there would be a decline of about half a percentage point in the state's overall low birth weight rate.

Among singleton births, inadequate weight gain during pregnancy is the largest contributor to low birth weight in Colorado. If all pregnant women gained weight adequately, the low birth weight rate for singleton births would be reduced by 12.8 percent, from 7.1 percent to 6.2 percent, a decline of nearly one percentage point.

Smoking among pregnant women is another significant contributor to Colorado's low birth weight problem. If all pregnant women did not smoke or quit smoking early in pregnancy, Colorado's singleton low birth weight rate would be reduced by 11.9 percent, resulting in a decline from 7.1 percent to 6.2 percent.

Inadequate weight gain during pregnancy and smoking are together the two most important factors in

low birth weight among singleton births. Since the two factors have an effect on each other, the population attributable risk for inadequate weight gain and smoking is greater than the effect of each considered separately. Colorado's low birth weight rate among singleton births could be reduced by one-third, from 7.1 percent to 4.7 percent, if pregnant women who smoked were able to stop smoking and if women who gained too little were able to gain weight adequately. The *overall* state low birth weight rate (including multiple gestations) could be reduced by one-quarter, from 8.7 percent to 6.4 percent, if all pregnant women gained weight adequately and did not smoke.

By reducing the occurrence of other treatable factors, the state's low birth weight rate could be decreased even more. Nearly one-half (47 percent) of the rate could be eliminated by ensuring adequate weight gain, eliminating smoking, beginning prenatal care in the first trimester, and lengthening the interpregnancy interval among parous women. If this could be accomplished, over 2,000 low weight singleton births could be averted in 2001, decreasing the singleton low birth weight rate from 7.1 percent to 3.8 percent. In addition, if multiple births were reduced to a naturally occurring level (eliminating those resulting from assisted reproduction), the overall state rate could be reduced to 5.1 percent. Such declines would enable Colorado to come close to meeting the Healthy People 2000/2010 goal for low birth weight of 5.0 percent. If the occurrence of premature rupture of the membranes (PROM) could be decreased or eliminated, the state rate could drop even further.

The analysis of low birth weight in this report focuses on those factors with high population attributable risks that are also seen as amenable to modification or treatment. Some of these factors are more behavioral in nature and therefore, less likely to be altered by traditional medical interventions. Thus, addressing these factors requires a significant change in approach. Health care providers, policymakers, pregnant women and payors all have a role to play in reducing Colorado's low birth weight rate. Solutions recommended in this report include:

- Decreasing the incidence of multiple gestation by reducing the likelihood that assisted reproductive techniques will result in multiple births;
- Assuring that all women have appropriate nutrition information and monitoring to gain an adequate amount of weight;
- Assisting all women to stop smoking prior to conception and during pregnancy;
- Decreasing the incidence of premature rupture of the membranes by assuring that all women at risk for lower genital tract infections are screened and treated during pregnancy, and by increasing client awareness of signs and symptoms of premature labor.

In a broader sense, efforts during the preconception period should focus on promoting access to and consistent use of contraception, screening and counseling women to assist in reducing modifiable risk factors for low birth weight, and educating consumers in general about the risks for and consequences of low weight births. Behavioral and lifestyle counseling should also be incorporated into the content of prenatal care.

Statewide commitment to these strategies, supported by all stakeholders, can result in a decrease in

the low birth weight rate in Colorado to a level close to the Healthy People goal of 5.0 percent.

Acknowledgements

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Tipping the Scales: Weighing in on Solutions to the Low Birth Weight Problem in Colorado

The Problem

Introduction

Low birth weight is a significant health problem, contributing both to infant mortality and to long-term developmental and neurological disability (1, 2). Low birth weight infants are defined as those weighing 5 pounds, 8 ounces or less (under 2,500 grams). This classification includes those low weight infants who are small for gestational age as well as those who may be born prematurely (less than 37 weeks gestation). The United States low birth weight rate of 7.5 percent in 1997 falls well short of the Healthy People 2000 goal, a major U.S. public health initiative, which was set at a rate of 5.0 percent to be achieved by the year 2000. (The Healthy People 2010 goal remains the same.) The United States low birth weight rate is currently at a level that is 50 percent higher than the goal.

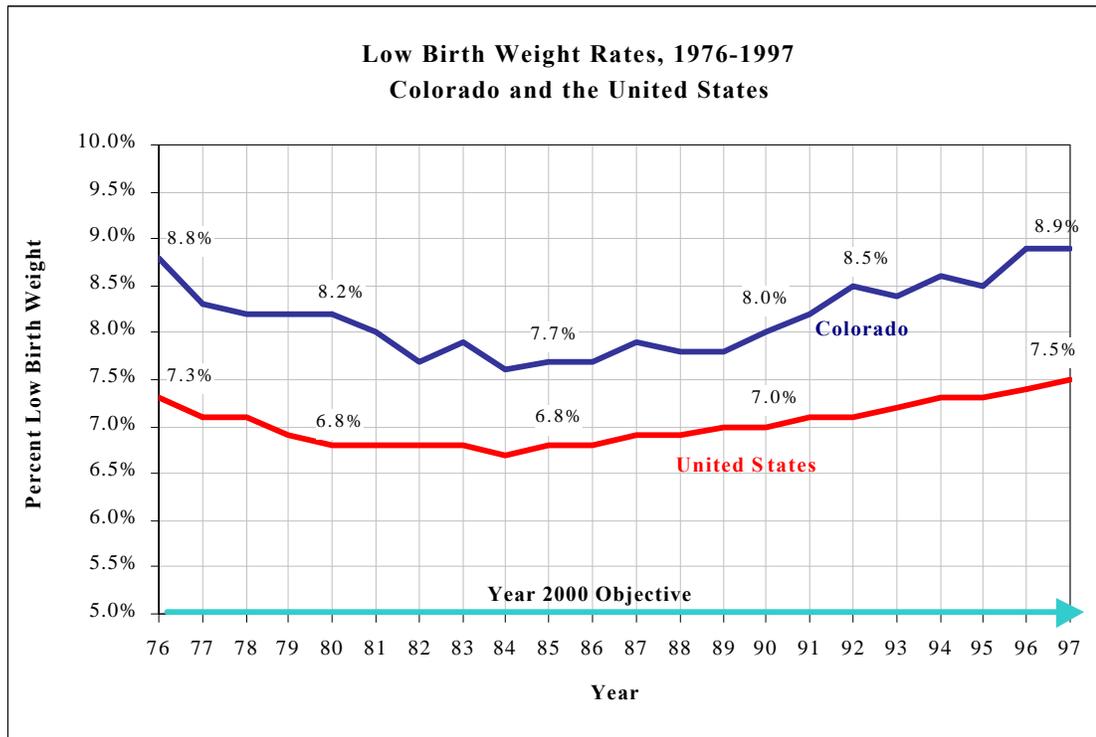
Within the United States, Colorado reports one of the highest low birth weight rates in the nation (see Appendix A). Colorado's low birth weight rate in 1997 was 8.9 percent.^a Only five states and the District of Columbia had higher rates (Louisiana, Mississippi, Alabama, South Carolina, and Wyoming). Moreover, Colorado had the second highest rate among white mothers of any state, with 8.5 percent giving birth to low birth weight infants (3).

Low birth weight infants have a higher mortality rate than normal weight infants. In Colorado, the 1997 infant mortality rate for all births was 7 deaths per 1,000 births. For low birth weight infants, the rate was 48.1, a level seven times higher. However, serious and costly morbidity is a far more common outcome than mortality for low birth weight infants. Beginning with neonatal intensive care, assisted ventilation, multiple invasive medical procedures and therapies, and continuing through developmental delays, repeated hospitalizations, and increased susceptibility to illness, the health of low weight infants is often compromised for many years; for some throughout life. The most severe problems are found in very low birth weight infants weighing 3 pounds, 4 ounces or less (less than 1,500 grams) at birth, many of whom are born prematurely. Colorado's very low birth weight rate of 1.3 percent equals the U.S. rate, while the state's prematurity rate of 8.6 percent was below the national average of 11.4 percent in 1997.

For at least the past 50 years, Colorado's low birth weight rate has consistently been higher than the U.S. rate. Figure 1 displays the trends since 1976, and reveals that Colorado's rate exceeds the U.S. rate by about one percentage point or more; in 1997 it exceeded it by 1.4 percentage points. A total of 5,014 low birth weight infants were born out of 56,505 births to Colorado residents in that year.

^a The 1998 low birth weight rate was 8.7 percent for Colorado.

Figure 1- Low Birth Weight Rates, 1976-1997



Background

The Colorado Department of Public Health and Environment has been monitoring Colorado’s high low birth weight rate for many years, and has provided information about county low birth weight rates and age-and race-specific low birth weight rates in the annual *Colorado Vital Statistics* reports.^b In an attempt to further quantify this problem in 1998, the Department conducted a multiple regression analysis of low weight births. Eighteen factors captured on the birth certificate were determined to be closely associated with low birth weight (4). The most important factors included premature rupture of the membranes, poor maternal weight gain, pregnancy-associated hypertension (PIH) and/or eclampsia, maternal smoking, abruptio placenta, previous preterm or small for gestational age birth, hydramnios/oligohydramnios, and black race.^c The identified factors are similar to those noted in the extensive literature on low birth weight (5,6,7). The study identified factors that are serious, but did not analyze how prevalent these conditions were in the population.

Although the factors most commonly associated with low weight births were identified, their precise contribution to the numbers of low weight births in Colorado had not been determined. Thus, in

^b The most recent published report is *Colorado Vital Statistics 1998*, Health Statistics and Vital Records, Colorado Department of Public Health and Environment, May 2000.

^c Race categories on the birth certificate are “American Indian, Black, White,” etc. This report uses the birth certificate designation of black in place of other terms such as African-American.

1999, the Department conducted an investigation to determine which of these factors were associated with the most low weight births (8). This new analysis provided estimates of the number of low weight births that can be attributed to a variety of risk factors. It is important to note that the factors identified were confined to those collected on the state birth certificate. Although the results are not reported, the data were stratified to control for confounding factors. There were no significant differences among groups when stratifying.

Risk Factors for Low Birth Weight

The perennial explanation for Colorado's relatively high low birth weight rates compared to other states has been high altitude. Colorado's residents live at altitudes between 3,000 and 11,000 feet above sea level. It has been demonstrated that high altitude contributes to an excess of low birth weight, and that this excess increases as altitude increases, reaching a 50 percent excess at the highest (9,000-11,000 feet) compared to the lowest (3,000-5,000 feet) elevations. Altitude has an effect independent of other factors, such that with each incremental increase of 1,000 meters (3,300 feet) between 3,000 and 11,000 feet of elevation, there is a decrease of 102 grams (3.5 ounces) in birth weight (about one ounce per 1,000 feet). In addition, the occurrence of pregnancy-induced hypertension, another risk factor for low birth weight, is increased at high altitude. Pregnancy-induced hypertension is two and a half times more common at the highest compared to the lowest altitude in Colorado (9).

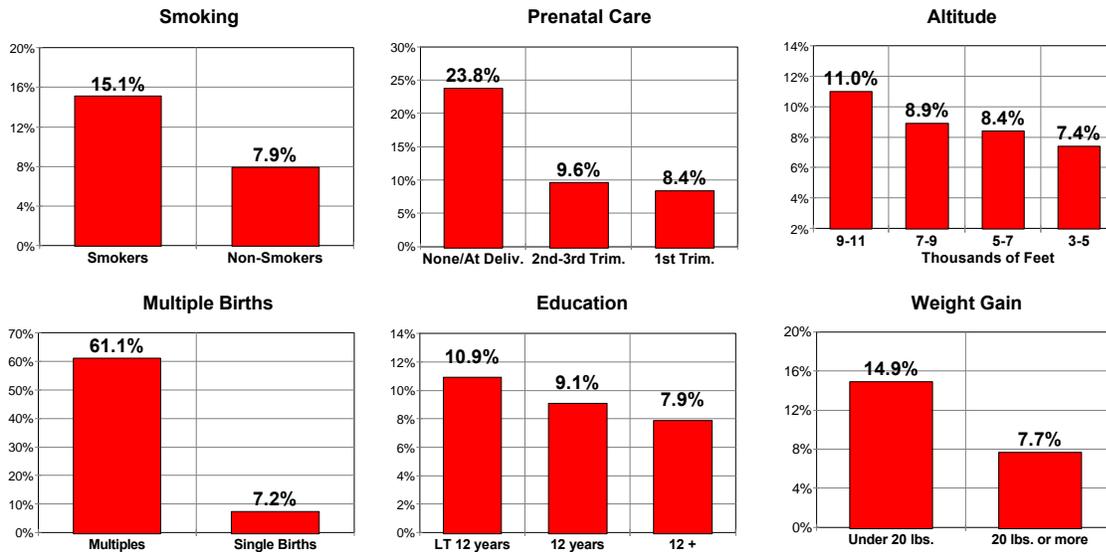
This current report does not specifically address the contribution of high altitude to Colorado's low birth weight problem compared to other states. The advent of geographic information software systems (GIS) has added to our understanding of the impact of elevation, confirming that a portion of the state's low birth weight rate can be attributed to births occurring at elevations above 3,000 feet (a level above which all births in the state take place). However, both GIS data and the 1998 regression analysis suggest that elevation plays a secondary role in Colorado's low birth weight problem, and that other factors are far more important. The Department anticipates further study of the role of high altitude, but recognizes that since altitude is not a factor that can be eliminated or reduced, solutions must be found in areas that are amenable to intervention. Indeed, Colorado's high altitude makes it imperative that effective solutions be identified.

Figure 2 on the following page illustrates the impact of a variety of risk factors and characteristics, including altitude, on low birth weight. For example, information in Figure 2 suggests that a real reduction in the proportion of pregnant women who smoke would be associated with a reduction in the state's overall low birth weight rate. Theoretically, if pregnant women did not smoke, the state's low birth weight rate would drop from 8.9 percent overall to 7.9 percent, the level for all non-smokers (1996 data). Similarly, better access to early prenatal care, improvements in weight gain, and so on, would also lead to a reduction in the overall level of low birth weight as well. While some factors can be altered more readily than others, a factor such as altitude is fixed.

Since many factors have an impact on Colorado's low birth weight rate, it is challenging to determine which factors exert the largest effects. Some medical factors are closely associated with low birth weight. For example, low birth weight is closely associated with abruptio placenta; about half of all births complicated by abruptio placenta are low weight. However, not many women (fewer than 350 per year) experience this condition, and therefore, abruptio placenta accounts for a very small

proportion of low weight births in the state. Many of the medical factors are manifested in only a small number of women. Even though the low birth weight rates in these groups are high, their contribution to overall low birth weight is small.

Figure 2 - Low Birth Weight (LBW) Rates by Risk Factors/Characteristics, Colorado 1996
Overall LBW Rate = 8.9%



Source: Colorado Birth Certificate Data, 1996. Altitude data calculated from the mother’s place of residence.
 Note: Left (vertical) axis is percent low birth weight. Education “12 +” should read “> 12.”

Therefore, the question that the 1999 study was designed to answer was, “Which factors in Colorado are associated with the most low weight births?” Population attributable risks were calculated to answer the question.

Population Attributable Risk: Which Factors are Associated with the Most Low Weight Births

Population attributable risk (PAR) is a statistical measure that combines the prevalence of a condition in a population (e.g., what percent of pregnant women smoke) with the severity or importance of that condition (smoking doubles the risk of low birth weight) to yield a percentage of the total (low birth weight) rate that is “attributable” to the condition in that population. The population attributable risk due to smoking will be *high* in a population where many women smoke and it will be *low* in a population where few women smoke, even though women who smoke are at increased risk for low birth weight.

For purposes of this analysis, the Colorado Department of Public Health and Environment was interested in conditions which were prevalent or common *and at the same time* conditions that were serious (highly related to low weight births). The combination of prevalence and severity yields high population attributable risks. Identifying these risks, and then determining those which can be altered or reduced would assist the Department in targeting those factors that should be addressed in

Colorado.

Calculating population attributable risk is useful because its value represents the reduction in low birth weight that can theoretically be achieved by eliminating the risk factor. Therefore, if the population attributable risk of factor A is 10 percent, the low birth weight rate of the population can be reduced by 10 percent if factor A can be eliminated. To achieve such reductions, however, several conditions must be met:

- the risk factor must be causally related to low birth weight for its elimination or treatment to reduce the risk of low birth weight;
- a treatment must be available and effective in removing the risk factor;
- removal or treatment of the risk factor must eliminate its effects on low birth weight (treatment must stop the pathophysiologic processes through which the risk factor causes low birth weight); and
- the risk factor being treated must be independent from other risk factors that influence low birth weight.^d

It is possible to add population attributable risks together if the factors are not related. Therefore, if Factor A with a PAR of 10 percent is completely unrelated to Factor B which has a PAR of 5 percent, then the population attributable risks may be added together for a combined PAR of 15 percent. If both Factor A and Factor B could be fully addressed and eliminated, the low birth weight rate would decline by 15 percent. However, to the extent that Factor A and Factor B are interrelated, the PARs cannot be summed because the result will either overstate or understate the impact of the combined factors.

Population Attributable Risk Results Among All Births

Multiple Gestation

Population attributable risks were calculated using all birth certificate data from the 166,591 births occurring to residents of Colorado in the three-year period 1995-1997. The largest population attributable risk was determined to be 19.9 percent for multiple gestation. This PAR means that the state's 1995-1997 overall low birth weight rate of 8.7 percent could theoretically be reduced by 19.9 percent, to 7.1 percent, if multiple gestations were no more likely to be born at low weight than singletons.

Multiple gestation is associated with a large population attributable risk not because of its prevalence (just 3.1 percent of all births), but because of its severity. Nearly six out of every ten twins (58.1

^d For example, the educational level of the mother is inversely related to low birth weight, and appears to be very important, since the low birth weight rate for mothers with less than a high school education is 10.9 percent, while it is 7.9 percent for those with more than a high school education (See Figure 2). The educational level of a mother, however, is unrelated to the physiological processes that take place during pregnancy. The educational level is a confounding variable; that is, a marker, for example, for smoking status (only 2 percent of women with a college education are smokers vs. 18 percent among women with less than a high school education). Smoking may be the underlying variable which must be eliminated in order for the low birth weight rate to improve.

percent) are low birth weight, as are 94.7 percent of triplets, and all quadruplets. Rates of low birth weight, very low birth weight and infant mortality are 4 to 33 times higher for twin, triplet and higher order births versus singletons (10). Given these data, even small increases in the rate of multiple births lead directly to increases in the overall low birth weight rate.

In the U.S., the number and rate of twin, triplet and other higher order multiple births have increased dramatically over the past decade. The number of twin births overall rose 52 percent between 1980 and 1997 and the number of triplet and higher orders births rose 404 percent. Between 1980-1982 and 1995-1997, the twin rate rose 63 percent for women age 40 to 44 and increased almost 1,000 percent for women age 45 to 49 (the group with the highest twin and triplet birth rates in the nation). Non-Hispanic white women were more than twice as likely as non-Hispanic black or Hispanic women to have a triplet or higher order birth (10).

In Colorado, these data are much the same. Colorado ranks as one of the ten states in the country with the highest twin and triplet birth rates.^e The percentage of multiple births in Colorado has increased by 60 percent from 1.9 percent in 1975 to 3.1 percent in 1997. While a percentage of multiple gestation occurs naturally in a population, especially to those women who delay childbearing until older ages (10), this rapid increase is mainly attributable to the use of assisted reproductive technologies which greatly increase the likelihood of multiple gestation (11,12). Assisted reproduction, then, while enabling infertile couples to bear children, has at the same time contributed disproportionately to the growing number of low birth weight and very low birth weight infants in Colorado. Additional information on multiple births in Colorado is provided in Appendix B.

Multiple Birth Reduction

Low birth weight related to multiple birth could be reduced by effecting some change in assisted reproductive technology (ART) to decrease the incidence of twin and higher order births. If the proportion of multiple gestations could be reduced to naturally occurring levels, a prospect more likely than reducing the low birth weight rate occurring with multiple gestations, the state's overall low birth weight rate could be reduced by an estimated half of a percentage point, from 8.7 percent in 1995-1997, to 8.3 percent. A 19.9 percent decline in the state low birth weight rate (based on the population attributable risk for multiples noted earlier) is not likely, because such a decline is dependent on eliminating the excess low birth weight that is commonly associated with multiple compared to singleton gestations.

Since other medical risk factors are often associated with multiple gestations, the remainder of this analysis is limited to singleton births. This approach removes multiple gestation as a potential confounding factor, focusing on major contributors to low birth weight in singleton births, which

^e The states with the highest rates for twins are Connecticut and Massachusetts (3.3%); New Jersey (3.1%); Nebraska (3.0%); Delaware, Maryland, and New York (2.9%); and Colorado, the District of Columbia, and North Dakota (2.8%), using 1995-1997 data. For triplets, the states are the same with the exceptions of North Dakota and the District of Columbia, which drop out, and Minnesota and Illinois, which are added. Source: *National Vital Statistics Reports*, "Trends in Twin and Triplet Births: 1980-1997," Vol. 47, No. 24, September 14, 1999.

Colorado has one county (Douglas) where over 4 percent of all births are multiples, meaning that more than one out of every 25 infants born in that county is a twin or triplet, and that fully one out of every three of the county's low birth weight infants is a multiple.

made up 96.9 percent (161,491) of all births in the state during the three-year study period, 1995-1997.

Population Attributable Risk Results Among Singleton Births

Three factors, with PARs close to 10 percent or greater, were determined to play a significant role in Colorado's singleton low birth weight rate:

- Inadequate maternal weight gain during pregnancy
- Maternal smoking
- Premature rupture of the membranes (PROM)

Table 1 lists a number of factors along with their population attributable risks. The three factors with the highest population attributable risks appear to be remediable, i.e., the contribution of each to low birth weight can be reduced through intervention. Other factors have population attributable risks that are lower and therefore contribute less significantly to the problem of low birth weight.

Most of the factors in Table 1 are self-explanatory, i.e., inadequate weight gain, smoking, pregnancy-induced hypertension (PIH), and clearly identify problems to be addressed. Some of the others are less clear. For instance, the PAR for women under the age of 18 may be a marker for the different biological, sociological, and environmental factors that impact young women. In addition, race and ethnicity are used in this context to reflect social, cultural, and environmental influences, such as stress, racism, and/or poverty, rather than biological or genetic factors. Black race and Hispanic ethnicity are best thought of as indicators of other risks and not as causal factors on their own.

Inadequate Weight Gain

Inadequate weight gain is a significant factor in low birth weight, with a population attributable risk of 12.8 percent. If the problem of inadequate weight gain could be eliminated among pregnant women, resulting in all pregnant women gaining an adequate amount of weight, the state's singleton low birth weight rate of 7.1 percent could be reduced to 6.2 percent (a 12.8% reduction), lowering Colorado's singleton low birth weight rate by nearly one full percentage point.

Data concerning the effects of weight gain on fetal growth are virtually unanimous in reporting a positive relationship between prenatal weight gain and birth weight. The risk of delivering a low weight infant therefore decreases as more weight is gained during pregnancy. Among women who gain weight adequately, the rate of low birth weight is well below the rate found among women who

**Table 1 - Population Attributable Risks for Low Birth Weight Among Singleton Births
Colorado, 1995-1997
State Singleton LBW Rate = 7.1%**

Factor	Population Attributable Risk (PAR)	Prevalence Among Mothers	LBW Rate For Factor	Hypothetical State Singleton LBW Rate if Factor Eliminated
Top Three PARs:				
Inadequate Weight Gain	12.8%	25.7%	9.4%	6.2%
Smoking	11.9%	11.6%	13.4%	6.3%
Prem. Rupture of Membranes	9.1%	2.6%	31.0%	6.5%
Other PARs:				
PIH or Eclampsia	6.8%	3.5%	20.3%	6.6%
Maternal Black Race	6.3%	4.6%	13.4%	6.7%
Hispanic Ethnicity	4.6%	22.0%	7.7%	6.8%
Age < 18	3.9%	4.8%	11.0%	6.8%
Hydramnios	3.2%	1.5%	22.0%	6.9%
Abruptio Placenta	3.1%	0.6%	45.6%	6.9%
Prior Preterm Birth	2.9%	1.2%	24.2%	6.9%
Short Interpregnancy Interval*	2.4%	15.9%	7.1%	6.9%
No Prenatal Care**	2.3%	0.9%	21.4%	6.9%
Other Bleeding	1.3%	0.6%	23.9%	7.0%
Placenta Previa	1.0%	0.3%	29.0%	7.0%
Alcohol Use	1.0%	1.3%	12.5%	7.0%
Altitude > 10,000 feet	0.8%	3.6%	9.1%	7.1%
Incompetent Cervix	0.8%	0.2%	32.8%	7.0%

* Less than 12 months between previous delivery and subsequent conception.

** No prenatal care or care only at delivery.

do not gain an adequate amount of weight. Furthermore, the pattern of gestational weight gain, especially during late pregnancy, is also important, with a positive relationship existing between incremental second and third trimester weight gains and birth weight.

Inadequate weight gain is defined as total weight gain during pregnancy below the amount recommended in the Institute of Medicine (IOM) guidelines (13,14), based on pre-pregnancy body mass index (BMI) (Appendix C).^f For example, a woman whose BMI is normal (19.8-26) should

^f In this analysis, weight gain was determined for term infants to be adequate or inadequate according to IOM

gain between 25 and 35 pounds at term (38-42 weeks gestation). A woman whose BMI is low (<19.8) should gain 28 to 40 pounds, while a woman with a high BMI should gain between 15 and 25 pounds.

Inadequate weight gain has a large population attributable risk because of its prevalence in the population of pregnant women. In Colorado, for 1995 to 1997, one out of every four (25.7 percent) pregnant women gained less than the recommended amount of weight during pregnancy.^g While the impact of inadequate weight gain on fetal outcome is not comparable in severity to some other medical conditions, the fact that it is so common makes it a major contributor to the number of low weight births. The low birth weight rate among women who gain an adequate amount of weight is 6.0 percent, compared to 9.4 percent among women with an inadequate gain (1995-1997 data) (8).

While inadequate weight gain is a risk for all pregnant women, the risk is higher among the one in five Colorado mothers who are underweight at conception, according to the Colorado Pregnancy Risk Assessment Monitoring System (PRAMS)^h (15). Over one-third (35 percent) of these underweight women do not gain enough weight during pregnancy, compared to one-quarter (24 percent) of normal weight women, and 15 percent of women who are overweight at conception. However, over half (54 percent) of those who do not gain enough weight during pregnancy begin the pregnancy at normal weight.

Appropriate nutritional counseling is increasingly recognized as critical to ensure adequate weight gain during pregnancy. According to PRAMS data, more than two out of every three (65 percent) women who currently begin pregnancy underweight are able to gain an adequate amount of weight (15). Intensive effort is needed to improve medical advice regarding prenatal weight gain and to increase access to nutritional counseling and follow-up when weight gain is inadequate.

Smoking

The population attributable risk of smoking is 11.9 percent, nearly the same as the population

guidelines for normal weight women (adequate requires a 25 pound gain). For infants born prior to 37 weeks gestation, an adjustment for adequate weight gain was made, based on gestational age. Therefore, the mother of an infant born prematurely was classified as having an adequate weight gain if she had gained enough weight for that gestational age, as defined by the Women, Infant and Children (WIC) program prenatal weight gain grid.

^g In this analysis, using birth certificate data, information was available on weight gain during pregnancy, but not on each mother's BMI. Therefore, the determination that 25.7 percent of women in Colorado gained weight inadequately is considered to be an underestimate. For example, underweight women were considered to have adequate weight gain if they gained the correct amount based on women with a normal BMI (25 pounds at term), even though an underweight woman should have gained at least 28 pounds at term. The 25.7 percent is also an overestimate in that women who were overweight or obese at conception were not considered to have gained enough weight because they were being held to a 25 pound minimum standard instead of the lower 15 pound recommendation. Using the Colorado Pregnancy Risk Assessment Monitoring System data, which incorporates BMI information, to look at these estimates, it appears that twice as many women could have been misclassified as having adequate weight gain compared to women misclassified as having inadequate weight gain (6.6 percent vs. 2.8 percent). Therefore, the estimate of 25.7 percent of Colorado women gaining weight inadequately is, on balance, an underestimate.

^h PRAMS is an on-going population-based surveillance system designed to supplement vital records data and to generate state-specific data for planning and assessing perinatal health programs. Each month, a random sample of postpartum women is surveyed about a variety of perinatal health issues.

attributable risk for inadequate weight gain. If pregnant women did not smoke in Colorado, the singleton low birth weight rate would fall from 7.1 percent to 6.3 percent, again nearly a full percentage point. Smoking is a major contributor to the state's low birth weight rate because of its prevalence and its severity. It is a relatively common risk factor, which could theoretically be eliminated.

Maternal cigarette smoking is associated with an increased risk for perinatal and infant death as well as other complications of pregnancy including spontaneous abortion, placenta previa and abruptio placenta, fetal growth restriction resulting in low birth weight infants, and preterm birth (16,17). There is also some evidence that Attention Deficit Hyperactivity Disorder and other behavioral or learning problems may be linked to smoking during pregnancy (18). Exposure to environmental tobacco smoke has been linked to sudden infant death syndrome and respiratory illnesses, middle ear infections, and decreased lung function in children (19,20,21). In addition, smoking during pregnancy places a considerable financial burden on the health care system, as the costs of pregnancy-related complications due to smoking are estimated at about two billion dollars annually in the U.S. (22).

Adolescence is the critical period during which most women begin to smoke. Ninety-one percent of adult smokers initiate smoking before age 20; 77 percent of this group become daily smokers. Few women begin smoking after age 20, as in general, smoking decreases as age and education increase (23). In 1997 in Colorado, similar to the nation, almost 16 percent of mothers age 15 to 19 and 14 percent of mothers age 20 to 24 smoked during pregnancy. Of mothers reporting less than 12 years of education, 18 percent reported smoking as opposed to 2 percent of those with 16 or more years of education. Women on Medicaid are also more likely to smoke during pregnancy. Data from Colorado PRAMS (1997) reveal that nearly 25 percent of pregnant women on Medicaid reported smoking in the last three months of pregnancy versus 10 percent of non-Medicaid women (15).

White women in Colorado are more likely to smoke than women of color. Having a partner who smokes is also a risk factor for smoking. The challenge, then, is to eliminate smoking in women of reproductive age and to assist pregnant women to achieve smoking cessation early in pregnancy. Colorado data demonstrate that even light smokers (fewer than 10 cigarettes per day) exhibit markedly higher rates of low birth weight than non-smokers, whose low birth weight rate was 8.1 percent (1997). For light smokers, the low birth weight rate is 13.9 percent, compared to 16.7 percent for heavier smokers (10 or more cigarettes per day).ⁱ While light smokers do exhibit a slightly lower low birth weight rate than heavier smokers, significant reduction in low birth weight is only seen in those who do not smoke. Based on these data, cutting back on smoking is not an effective option during pregnancy.

It is important to stress that among women who smoke during pregnancy, fully three-quarters (76 percent) state that they smoke fewer than 10 cigarettes per day, while 22 percent claim 20 or fewer cigarettes per day, and only 2 percent state that they smoke more than a pack a day.^j The population attributable risk for light smoking is 8.8 percent, while the population attributable risk for moderate to heavy smoking is 4.4 percent. The low birth weight rate among singleton births has the potential to

ⁱ *Colorado Vital Statistics 1997*, Health Statistics and Vital Records, Colorado Department of Public Health and Environment, March 1999, Table B-23, p. 69.

^j Birth certificate data relative to smoking during pregnancy are based on self-reports. Smoking rates are probably underreported.

be reduced by almost 9 percent, from 7.1 percent to 6.5 percent, by eliminating smoking among light smokers only. Intervention and elimination of smoking in this group could reduce low birth weight in Colorado to a greater extent than intervention among women who admit smoking more, simply because the great majority of pregnant smokers categorize themselves as light smokers.

Interestingly, reported smoking has declined among Colorado birth mothers during the last decade. In 1990, 18 percent of mothers reported smoking during pregnancy. In 1997, just 10.6 percent of mothers smoked, a decline of 40 percent. The reduction that has already occurred suggests that further declines are possible.

Premature Rupture of the Membranes

Premature rupture of the membranes (PROM) is defined as rupture of the chorioamniotic membranes prior to the onset of labor (for more than twelve hours^k), regardless of the gestational age of the fetus (24). About 8 to 10 percent of women experience PROM at term (24). More important to the discussion of low birth weight is the fact that preterm PROM (PROM occurring at less than 37 weeks gestation) accounts for 25 percent of all cases of PROM and 30 percent of all premature deliveries in the U.S. (25). Premature delivery and the resulting complications of preterm birth (including infection) are the most common causes of perinatal morbidity and mortality associated with preterm PROM (24).

PROM, in general, affects few women (2.9 percent) but plays a significant role in Colorado's low birth weight problem. The population attributable risk for PROM is 9.1 percent, meaning that the state's singleton low birth weight rate of 7.1 percent could be reduced to 6.5 percent (a reduction of 9.1 percent), if this risk could be eliminated. Premature rupture of the membranes has a significant population attributable risk not because of its prevalence, which is small, but because of its severity: 31 percent of all births resulting from PROM in Colorado are low weight.

Because the membranes serve as a barrier between the sterile intrauterine cavity and the bacteria-rich environment of the vagina, ascending bacterial infection from the vagina is thought to be a likely cause of preterm PROM (26). Studies consistently show that women with group B streptococci, gonococci, and bacterial vaginosis (BV) have an increased risk for preterm PROM (27,28,29,30). A prospective, controlled trial confirmed that the presence of BV was associated with an increased risk of pregnancy loss at gestational ages under 22 weeks, preterm PROM, and premature birth (31). There has been considerable work demonstrating that treatment of BV in pregnancy reduces infection and decreases the rate of preterm birth with the greatest effect being achieved in populations at highest risk for BV (31,32,33,34,35).

While the literature consistently notes that both BV and intrauterine infection are associated with preterm birth, a recent large randomized trial of antibiotics for preterm birth prevention in women with asymptomatic BV did not note a decrease in the incidence of premature delivery (36). However, there are several methodologic issues which must be considered in interpreting the results of this study.¹ An editorial response to the study suggests that there is "enough evidence of the benefit of

^k PROM is defined as "greater than 12 hours" on the birth certificate. The addition of this time period changes the classic medical definition of this condition in this analysis.

¹ While this investigation did not find any differences between women treated before or after 20 weeks gestation, no

prophylactic antibiotics that women at high risk for adverse sequelae of infection should still be screened and treated” for BV (37, 38). In addition, treatment for BV should be initiated pre-conceptually or during the first or early second trimester to prevent “colonization of the upper genital tract from the vagina and the subsequent inflammatory process that results in preterm labor” (37).

Other factors are also associated with PROM. Smoking has been suggested as a factor in some studies while multiple gestation, abruptio placenta, previous preterm PROM, and previous cervical surgery or lacerations are also correlated with an increased risk of PROM (24).

Other Population Attributable Risk Factors

The population attributable risks of the other factors shown in Table 1 are substantially lower. These factors include age under 18, hydramnios, abruptio placenta, prior preterm birth, short inter-pregnancy interval, no prenatal care, other bleeding, placenta previa, alcohol use, very high altitude, and incompetent cervix. Most of these factors are medical conditions that occur so infrequently that their contribution to the number of low weight births is small, even though the low birth weight rates associated with the conditions are high.

Some of these factors are difficult to impact or eliminate. It is known that there are more low weight births at higher altitudes, but altitude is also a risk for which little can be done other than moving to a lower elevation. The PAR analysis demonstrates that the relative risk of low birth weight *within Colorado* is not significantly affected until elevation is greater than 10,000 feet (Table 1) and that, as noted above, other risk factors have much greater population attributable risks.

Some of the factors represent population rather than specific etiologic factors. For instance, if it were possible to identify reasons for the excess risk of low birth weight among black women, Hispanic women, or those under age 18, the low birth weight rate for Colorado could be further reduced. At this time, the PARs within these groups must be seen as markers for a myriad of other unknown causal factors. More research is needed to determine why these women are at higher risk for low weight birth.

In addition, a number of factors closely associated with low birth weight do not turn out, on their own, to have a large impact on the total number of low weight births in the state. These include a variety of severe complications, (e.g., abruptio placenta, placenta previa) and mothers receiving no prenatal care (of which there are very few). Indeed, the complete lack of prenatal care does not appear by itself to seriously affect the state’s overall low birth weight rate, since only 2.3 percent of all pregnant women receive, according to the birth certificate, “no care/care only at delivery.” If provision of care to these women were the sole focus of intervention, the state’s singleton low birth weight rate would only be reduced by 2.3 percent from 7.1 percent to 6.9 percent.

one in the sample was treated before 16 weeks gestation. The earlier in pregnancy that labor occurs, the more likely it is that a “pathologic initiating factor, such as infection” is involved (37). When lower genital infections are detected early in pregnancy, the likelihood of an adverse outcome is greater. Thus, late identification of BV is of concern in interpreting the study results. In addition, the treatment regimen used was not one recommended by the Centers for Disease Control (CDC) and the rate of elimination of BV in women receiving the placebo was so high that the results of the study could have been affected.

Combinations of Factors

The population attributable risks discussed so far have been presented as independent factors in low birth weight. Low birth weight, however, is a complex issue. Some risk factors are interrelated, such that calculation of the population attributable risk of two (or more) risks considered together is recommended. With this in mind, the Colorado Department of Public Health and Environment analyzed the top two remediable conditions, inadequate weight gain and smoking, together. These two factors were subsequently combined with two other remediable factors, delayed prenatal care and short interpregnancy interval. Addressing these factors in combination provides a measure of the potential overall power of intensive intervention in Colorado's low birth weight problem.

Inadequate Weight Gain and Smoking

Smoking in combination with inadequate weight gain has a particularly powerful impact on low birth weight, so that for all women who smoke and who also gain weight inadequately the risk of low birth weight is far greater than the risk associated with each factor alone. In Colorado, 8.2 percent of women smoked during pregnancy, 22.3 percent did not gain weight adequately, and 3.4 percent both smoked and did not demonstrate adequate weight gain. Those 3.4 percent of women were over three times more likely to have a low weight baby than those who did not smoke and who gained weight adequately, illustrating that these two factors in combination result in a much higher risk of low birth weight than when each factor exists alone. Because of this synergistic effect, the PAR for both of these factors is greater than the sum of the two individual factors.

The population attributable risk of inadequate weight gain and/or smoking is 34.4 percent, a PAR which is much greater than the sum (24.7 percent) of the two individual PARs for inadequate weight gain (12.8 percent) or smoking alone (11.9 percent). The population attributable risk of these two factors taken together means that Colorado's singleton low birth weight rate *could be reduced by over one-third* if all women gained weight adequately and did not smoke. Such a reduction in risk would lower the singleton low birth weight rate in Colorado from 7.1 percent to 4.7 percent (Table 2). In fact, the overall state low birth weight rate could be reduced by one-quarter, from 8.7 percent to 6.4 percent, if this occurred.

The combined PAR for inadequate weight gain and smoking is high because one in every three pregnant women in the state exhibits these factors alone or in combination. While the overall low birth weight rate is not especially high for those who gain weight inadequately and/or who smoke (9.8 percent), the fact that so many women demonstrate these risk factors means that their low birth weight experience exerts a large impact (Table 2).

Inadequate Weight Gain, Smoking, Delayed Prenatal Care, and Short Interpregnancy Interval

Considering other modifiable risk factors along with inadequate weight gain and smoking results in further potential declines in low weight births. A total of 11.6 percent of all pregnant women smoke, 25.7 percent gain weight inadequately, 18.6 percent do not begin prenatal care in the first trimester, and 15.9 percent experience an interpregnancy interval of less than 12 months.^m Women experiencing

^m One in six women (15.9 percent) who have had a baby experience a rapid repeat pregnancy, with conception occurring less than 12 months after the previous birth (8). (Colorado PRAMS data show that 48 percent of all pregnancies are unintended, i.e., pregnancy was not intended at the time of conception.) While medical experts differ on the minimum ideal interpregnancy interval, research shows that the best outcomes occur with at least 18 months between delivery and

one or more of these risks total about half of all pregnant women.

The population attributable risk associated with inadequate weight gain, smoking, delayed prenatal care (after the first trimester), and conception within one year of the last birth, in combination, is 47 percent. If all women gained weight adequately, did not smoke, accessed prenatal care in the first trimester, and did not conceive in less than 12 months from the last birth, the singleton low birth weight rate could be reduced by nearly half, declining from 7.1 percent to 3.8 percent, a very low rate.

Table 2 - Combinations of Population Attributable Risks for Low Birth Weight Among Singleton Births, Colorado, 1995-1997
State Singleton LBW Rate = 7.1%

Factors	Population Attributable Risk	Prevalence Among Mothers	LBW Rate For Combined Factors	Hypothetical State Singleton LBW Rate if Factors Eliminated
Inadequate Weight Gain and/or Smoking	34.4%	34.0%	9.8%	4.7%
Inadequate Weight Gain, and/or Smoking, and/or Delayed Prenatal Care, and/or Short IPI*	47.0%	50.5%	8.7%	3.8%

* Interpregnancy interval of less than 12 months between previous delivery and subsequent conception.

Summary of the Problem

Colorado has one of the highest low birth weight rates in the nation, with 8.7 percent of all infants born in 1995-1997 weighing 5 pounds 8 ounces or less. One out of every five of these low weight births was a multiple birth.

Reduction of the impact of multiple gestation on Colorado's low birth weight rate appears to be dependent on changes in assisted reproduction. If multiple births were limited to those that occur naturally, the state's low birth weight rate would decline by half of a percentage point. The largest contributors to Colorado's singleton low birth weight problem are inadequate weight gain, smoking, and premature rupture of the membranes. Addressing any one of these three fully, so that all women gain weight adequately, *or* do not smoke, *or* do not experience premature rupture of the membranes, would reduce the state's singleton low birth weight rate from 7.1 percent to 6.5 percent or less (Table 1).

Addressing combinations of factors found to be important determinants of low birth weight among singleton births, such as inadequate weight gain and smoking together, would have an even greater impact on low birth weight. If all women gained weight adequately and did not smoke, the state's singleton low birth weight rate would fall from 7.1 per cent to 4.7 percent (Table 2). Finally, if all women gained weight adequately, did not smoke, began care in the first trimester, and experienced an interpregnancy interval greater than 12 months, Colorado's low birth weight rate among singletons would drop from 7.1 percent to 3.8 percent, a decline of nearly 50 percent. The combination of a reduction in the prevalence of multiples and a reduction in the low birth weight rate among singletons would result in a low birth weight rate for Colorado of 5.1 percent among all births, essentially

subsequent conception (39).

meeting the Healthy People 2000/2010 goal of 5.0 percent.

Table 3 contains estimates for possible (theoretical) reductions in low birth weight in Colorado for the year 2001 (based on an expected total number of births of 65,000). At the current low birth weight rate, 5,680 low weight births are expected. However, if inadequate weight gain were fully eliminated, there would be 5,110 low weight births instead of the 5,680 expected, a drop of 570. If smoking were eliminated along with inadequate weight gain, there would be 4,170 low weight births instead of 5,680, a total drop of 1,510. In addition, ensuring early prenatal care and eliminating short interpregnancy intervals has the potential to drop the number of low weight births by 2,080. And if no more multiple births related to ART occurred, there would be only 3,320 low weight births instead of the 5,680 expected, a total decline of 2,360. If premature rupture of the membranes could be eliminated, the state rate and the absolute numbers of low weight births could decline even further.

Table 3 - Estimates and Possible Reductions in Low Weight Births: Colorado 2001

	Estimated Low Weight Births	Estimated Low Birth Weight Rate	Difference from Expected Number of Low Weight Births
Possibilities for the Year 2001			
Expected Number of Low Weight Births (based on actual 1995-1997 low birth weight rate)	5,680	8.7%	0
Inadequate Weight Gain Eliminated	5,110	7.9%	570
Inadequate Weight Gain and Smoking Eliminated	4,170	6.4%	1,510
Inadequate Weight Gain, Smoking, Delayed Prenatal Care, and Short Interpregnancy Interval Eliminated	3,600	5.5%	2,080
Inadequate Weight Gain, Smoking, Delayed Prenatal Care, Short Interpregnancy Interval, and ART-related Multiple Births Eliminated	3,320	5.1%	2,360

Based on an expected total number of births in 2001 of 65,000.

It is clear that Colorado's low birth weight rate could be dramatically reduced if these particular risks were reduced or eliminated. Proposed solutions to the problem of low birth weight are discussed in detail in the following section.

The Solutions

Factors Amenable to Treatment

In developing a list of solutions to the problem of low birth weight, the Colorado Department of Public Health and Environment focused on those factors, reported on the birth certificate, exhibiting the highest population attributable risk (PAR) for low birth weight that were potentially modifiable or amenable to “treatment.” Modifying the key factors identified earlier in this report (multiple birth, inadequate weight gain, smoking, and premature rupture of the membranes) would result in the largest reduction of low birth weight among pregnant women in Colorado. This population-based view of low birth weight implicates several factors, some more behavioral in nature, that are not necessarily amenable to traditional medical interventions. Addressing these factors then requires a change in approach. While no single set of interventions will resolve these problems, prenatal care in general as well as community, client, and provider education must focus on modification of behavioral and lifestyle issues and screening and treatment of genital tract infections as outlined below.

Multiple Births

As discussed earlier, multiple birth demonstrates a PAR of 19.9 percent, which, if completely resolved (all multiple births were eliminated), could lead to a concomitant 19.9 percent reduction in the state’s low birth weight rate (from 8.7 percent to 7.1 percent.) Multiple gestation increases the incidence of both perinatal and maternal morbidity and mortality (40). Rates of twin and higher order multiples (three or more) have been steadily increasing in both Colorado and the U.S. as a result of older age childbearing and the rising use of assisted reproductive technologies (10).

Assisted reproductive technology (ART) refers to those procedures that increase the likelihood of pregnancy among infertile couples. ART has been utilized in the U.S. since 1981 and mainly involves transferring fertilized human eggs into the uterus (in-vitro fertilization) (44). The high cost of assisted reproduction coupled with the fact that most insurers do not reimburse for this technology motivates both families and providers to utilize every opportunity (i.e., transfer of multiple embryos) to increase the odds of pregnancy, even when it is likely that multiple gestation will result (41,42).

One way to decrease the impact of multiple birth on the state’s low birth weight rate is to effect some change in ART to decrease twin and higher order births. The American College of Obstetricians and Gynecologists (ACOG) recommends that counseling for infertility treatment include a detailed discussion of the risks, benefits, and treatment options, including the option for no treatment. In addition, infertile couples should be made aware of the likelihood that multiple gestation may result from treatment and they should receive counseling about the perinatal risks associated with twin and higher order multiples. ACOG recommends that the moral, ethical, and emotional issues surrounding ART be discussed with couples prior to conception (43). The College further notes that many couples have unrealistic expectations of the outcomes of multiple births, based on those multiples that receive a great deal of media attention. The long-term problems that may result from higher order multiple births are rarely chronicled.

Limiting the number of embryos transferred or choosing not to initiate ovulation with hormones if many mature follicles are present can decrease or eliminate the incidence of ART-induced multiple birth (11,40,43,44). Several countries have legislation in place that limits the number of embryos that

can be transferred (45,46). While such legislation has not been enacted in the United States, the American Society for Reproductive Medicine has developed age and diagnosis-dependent guidelines for embryo transfer (47). A recent Centers for Disease Control analysis of in-vitro fertilization transfer procedures confirms that the risk of multiple birth varies by maternal age and the number of embryos transferred (e.g., women under age 35 demonstrated comparable live birth rates along with a decreased risk of multiples when only two embryos were transferred; women age 35-39 did so when three were transferred). Furthermore, the use of higher-quality embryos appeared to result in increased live birth rates when fewer embryos were transferred (48). Similarly, a study using population-based data from the United Kingdom noted that transfer of two embryos reduced the risk of multiple birth without affecting live birth rates in women regardless of their age (11). Emerging technology, resulting in improved embryo culturing techniques, may also decrease the need to transfer a large number of embryos (49).

Ideally then, judicious implantation of a limited number of high-quality embryos (based on maternal age) should result in acceptable live birth rates while decreasing the incidence of multiple gestation (12,43). Convening a group of reproductive endocrinologists involved in ART to discuss voluntary limits on embryo transfer and the use of newer technologies is one strategy to effect statewide change in ART practice. While preterm birth prevention is paramount, the likelihood of early delivery with higher order multiples is so great that reducing the number of pregnancies with twin or higher order multiples would result in the greatest reduction in low birth weight. Therefore, the solution lies in reducing the incidence of multiple gestations, because the low birth weight rate of multiples will probably remain high.

Inadequate Weight Gain

Inadequate weight gain plays a significant role in low birth weight, with a population attributable risk of 12.8 percent. If inadequate weight gain could be eliminated among pregnant women, the state's singleton low birth weight rate could be reduced by 12.8 percent, from 7.1 percent to 6.2 percent, dropping nearly one full percentage point. When maternal weight gain is within the recommended range, the incidence of low weight births is significantly decreased (13,14).

The Institute of Medicine (IOM) recommendations for weight gain during pregnancy are shown in Appendix C. These recommendations are based on studies of antepartal weight gain in large groups of women in order to achieve optimal birth outcomes (prevention of low weight births), while minimizing postpartum weight retention (14,50,51,52). Inadequate weight gain is defined as total weight gain during a term pregnancy (as reported on the birth certificate) that is below the amount recommended in the IOM guidelines (13,14), based on pre-pregnancy body mass index (BMI). For example, a woman whose BMI is in the normal range (19.8-26) should gain between 25 and 35 pounds at term. A woman whose BMI is low (below 19.8) should gain 28 to 40 pounds at term and a woman with a high BMI (26-29) should gain 15 to 25 pounds.

To reduce the incidence of low weight births due to inadequate weight gain, both the rate of weight gain and the total amount gained are used as important determinants of adequacy (19). Giving appropriate advice about nutrition and weight can influence weight gain during pregnancy and improve birth weight. The Colorado Prenatal Plus Program, which utilizes a multidisciplinary approach including case management, nutrition counseling, and social work consultation, assisted 78

percent of women at nutritional risk to gain weight adequately during pregnancy (53). While nutrition counseling would seem to be an integral component of prenatal education, one study found that 27 percent of women received no medical advice about weight gain during pregnancy. Not surprisingly, a lack of advice was associated with weight gain that was not within the IOM guidelines (54).

Efforts are needed to improve the quality and quantity of medical advice about prenatal weight gain. All providers and staff who come in contact with pregnant women should be educated about the current IOM recommendations for maternal weight gain based on pre-pregnancy BMI status. Efforts should be made to ensure that messages about weight gain during pregnancy are communicated effectively to pregnant women (i.e., at the appropriate literacy level and in the appropriate language). Colorado PRAMS data have shown that white, non-Hispanic women have the lowest prevalence of inadequate weight gain (23 percent), compared to Hispanic women (32 percent) and black women (42 percent). Those with the highest percentage of inadequate weight gain also had incomes less than \$16,000 and completed less than 12 years of education. Thus, prenatal education efforts that target low-income and minority women are important for reducing the prevalence of inadequate maternal weight gain, especially where inadequate weight gain is related to low income. These efforts, however, must be incorporated into the standard prenatal visit for all pregnant women, since the problem of weight gain spans all income, age, and racial groups.

Societal demands to be thin, coupled with negative body image issues, may cause emotional distress in women faced with the prospect of gaining weight during pregnancy. Few women view weight gain as positive, even if it is understood that it will result in a healthier baby. Thus, messages about maternal weight gain need to be individualized to the particular beliefs and biases of each woman. Access to a multidisciplinary team of professionals (e.g., registered dietitian and social worker/counselor) are helpful when nutritional and emotional factors related to weight gain need to be addressed.

To prevent inadequate maternal weight gain, all pregnant women should have their weight measured and assessed for adequacy at each prenatal visit, using an appropriate weight gain chart to show the range and rate of weight gain recommended. Assessment of the rate of weight gain should follow the IOM guidelines based on pre-pregnancy BMI status. Women with inadequate weight gain should be seen, early in pregnancy, by a registered dietitian for further assessment and individualized nutrition therapy, including referral to the Women, Infant and Children (WIC) supplemental food program, where appropriate. Because the impact of weight gain on fetal weight is greatest among those women who are underweight at the beginning of pregnancy, particular attention should be paid to women with pre-pregnancy underweight status (7). However, it is important that all women receive appropriate education and follow-up regarding nutrition and weight gain during pregnancy.

Smoking

The population attributable risk of smoking is 11.9 percent, nearly the same as the population attributable risk for inadequate weight gain. If pregnant women did not smoke in Colorado, the singleton low birth weight rate would fall from 7.1 percent to 6.3 percent, almost a full percentage point.

As noted earlier, smoking is associated with a variety of perinatal health risks. Ideally, the easiest way

to reduce the incidence of smoking among pregnant women is to reduce the number of adolescent females who become smokers. Since many women begin smoking during adolescence, prevention efforts should begin in childhood, with cessation efforts ideally commencing in the preconception period. Twenty-five percent of women quit smoking as they prepare for pregnancy or once their pregnancy is confirmed (55). Colorado PRAMS data for 1997 reveal that nearly half of all women who smoke prior to conception stated that they had quit smoking by the last trimester of their pregnancies (15). Those who quit spontaneously appear to be more concerned about the effects of smoking on the fetus and have more years of schooling. As a group, they are probably less addicted (56). Thus, those providing health care services to adolescents and childbearing-age women should address both the perinatal (including the effects of environmental tobacco smoke on the infant) and general health risks of smoking, initiating smoking cessation efforts prior to pregnancy. Pharmacologic methods to enhance cessation should be employed in the preconception period, based on the client's readiness to quit. These efforts to facilitate cessation are especially important as Colorado PRAMS data demonstrate that half (52 percent) of all women who quit smoking during pregnancy resume after delivery (15).

In spite of these problems, pregnancy does provide a unique opportunity for smoking cessation because women are motivated to stop smoking to protect the health of their infants. This motivation functions as the cornerstone of provider counseling efforts. Complete cessation of smoking should be the message, as cutting back on smoking is not an effective option for low birth weight reduction. *Women should stop smoking prior to pregnancy and pregnant smokers should quit.*

Research has established a set of "Best Practice"ⁿ interventions to promote smoking cessation during pregnancy. Brief (5-15 minute) counseling from a trained health care provider, incorporated into routine prenatal care, along with culturally relevant, pregnancy-specific, self-help materials can increase cessation rates during pregnancy from 5 to 10 percent to 15 to 20 percent (56). In addition, Phase I of the Robert Wood Johnson Foundation Smoke-Free Families Initiative identified that combining these interventions with economic incentives and biochemical feedback (maternal/infant cotinine levels, carbon monoxide levels or ambient home cotinine levels) seems to be an effective strategy to increase the rate of cessation (55). The provider's personal commitment to helping women stop smoking was also viewed as an important component of successful interventions (57). Colorado PRAMS data for 1997 note that 14 percent of pregnant women who reported smoking in the three months before pregnancy did not receive any information about smoking cessation from their prenatal providers (15). Thus, health care providers must consistently address this issue with clients.

However, due to the addictive nature of tobacco, many women continue to smoke during pregnancy, despite knowledge of the risks for maternal and infant health. The Smoke-Free Families Initiative notes that "growing awareness of the adverse effects of smoking on pregnancy has led an increasing number of pregnant smokers to conceal or underreport their smoking behavior." (55) When compared with hospital medical reports, birth certificates underreport smoking by 15 to 28 percent (58,59).

The heaviest smokers are usually not able to achieve cessation with behavioral interventions alone.

ⁿ Evidence-based strategies/approaches that have been shown by research and evaluation to be effective are called "Best Practices."

The use of pharmacologic therapies with this population is currently being explored (60,61). Since the majority of pregnant smokers in Colorado classify themselves as light smokers (less than 10 cigarettes per day), even taking into account client underreporting of smoking behavior, implementing the Best Practice recommendations should be an effective way of promoting smoking cessation. Utilizing these recommendations along with a multidisciplinary approach, the Colorado Prenatal Plus Program has demonstrated self-reported prenatal smoking cessation rates of 52 percent (53).

Prenatal smoking cessation is cost-effective. A recent California study estimated that the average excess direct medical cost per live birth for each pregnant smoker (in 1995 dollars) was \$511 (63). Similarly, other studies have demonstrated that smoking cessation for pregnant women results in savings of \$2 to \$3 for every dollar spent (64). The savings from preventing hospitalizations for illnesses and conditions related to low birth weight are more than \$6 for every \$1 spent on smoking cessation (65). It is estimated that an annual decrease of only 1 percent in smoking prevalence in the United States would result in 1,300 fewer low weight births nationally and would save \$21 million in direct medical costs in the first year of a smoking cessation program (63). Lack of consistent reimbursement for smoking cessation does impose a significant financial barrier to widespread implementation of a smoking cessation effort. Long-term strategies include advocacy with insurance companies, including Medicaid, to encourage and adequately reimburse providers and programs for these services.

Inadequate Weight Gain and Smoking

Interventions for women who experience inadequate weight gain and who also smoke should be focused on resolving both of these behaviors. In 1998, in the Colorado Prenatal Plus Program, 40 percent of those women who were at nutritional risk and who also smoked were able to both gain adequate weight and quit smoking after receiving nutritional counseling from registered dietitians and consistent provider messages about smoking cessation (53). Counseling and follow-up around weight gain and smoking cessation is paramount.

Premature Rupture of the Membranes (PROM)

PROM affects few women (2.9 percent) but demonstrates a PAR of 9.1 percent. Colorado's singleton low birth weight rate of 7.1 percent could be reduced by 9.1 percent to 6.5 percent, if this risk could be eliminated. As noted earlier, preterm PROM (PROM occurring at less than 37 weeks gestation) is associated with 30 percent of all premature deliveries in the U.S. (25). Premature delivery and the resulting complications of preterm birth (including infection) are the most common causes of perinatal morbidity and mortality associated with this condition (24).

As noted earlier, ascending bacterial infection from the vagina is thought to be a likely cause of preterm PROM (26). Studies consistently show that women with group B streptococci, gonococci, and bacterial vaginosis (BV) have an increased risk for preterm PROM (27,28,29,30). From the standpoint of prevention, better identification of those at risk for preterm PROM, including prompt diagnosis and treatment of lower genital infections (e.g., gonococci, chlamydia, trichomonas, and bacterial vaginosis) may decrease the incidence of this condition. McGregor and French recommend that pregnant women be screened and treated (if positive) for BV, chlamydia, gonorrhea, trichomonas, and bacteriuria as early in pregnancy as possible (31,33). Screening and treatment can be repeated at 20 and 28 weeks gestation for those at risk for repeated infection. Partners should be

treated for STDs. “Tests of cure” are recommended for both STDs and BV after completion of therapy. Treatment of both asymptomatic and symptomatic infections is recommended (31,33). Despite the results of a recent study by Carey, there is still enough evidence of the benefit of antibiotic therapy that women at high risk for lower genital tract infections should be screened and treated in early pregnancy (38).

In addition, efforts such as the Colorado Premature Birth Prevention Project aim to educate both clients and health care providers about preterm birth prevention. This project encourages providers to screen for historical and medical risk factors for preterm birth; to educate the client about the signs and symptoms of premature labor; to screen and treat for lower genital tract infections; and to evaluate clients for a “shortened cervix” at 22 to 24 weeks gestation. A media campaign along with a comprehensive client education booklet conveys prevention information to clients and consumers to increase awareness about this issue.

Inadequate Weight Gain, Smoking, Delayed Prenatal Care, and Short Interpregnancy Interval

Since fifty percent of women in Colorado experience one or more of these risks, addressing weight gain and smoking issues during pregnancy is only part of the solution. Prenatal care must begin in the first trimester and access to care must be assured. Consistent use of family planning can increase the interval between births which leads to subsequently improved pregnancy outcomes (66). Thus, effective contraceptive methods, including emergency contraception, must be available, accessible, and consistently utilized during both the preconception and postpartum periods. Assuring adequate weight gain and smoking cessation along with accessing early prenatal care after an appropriate interpregnancy interval (at least 18 months) would result in significantly reduced rates of low birth weight in Colorado.

Recommendations for Providers, Policymakers, Childbearing-age Women, and Payors

The above discussion has included a number of strategies for impacting Colorado’s low birth weight rate. A summary of solutions is outlined below, followed by a list of tasks that can be accomplished by particular constituent groups, such as health care providers, policymakers, childbearing-age women, and payors for health care services. All stakeholders must understand that low birth weight is a critical problem in Colorado that can be reduced through intervention/risk reduction.

Summary of Solutions

Focus preconception planning, screening, and counseling on low birth weight risk reduction

The prevalence of each of the major population attributable risks (multiple births, inadequate weight gain, smoking, and premature rupture of the membranes) could be reduced during the preconception period. Information about the risks and benefits of assisted reproductive technology, including the risks and possible long-term problems associated with multiple birth, could reduce the incidence of higher order multiple births. Early identification of childbearing-aged women who are underweight, and increasing awareness of healthy eating habits prior to pregnancy are steps that can improve pre-pregnancy nutrition status. Preconception smoking cessation not only reduces potential fetal exposure to tobacco, but also allows utilization of pharmacologic approaches to assist women in achieving cessation. Pre-pregnancy identification of lower genital tract infections may reduce colonization of the upper genital tract and subsequent inflammation that could later result in preterm labor. Finally, promoting access to and consistent use of contraception, including emergency contraception, can assist women in planning pregnancy and increasing the interpregnancy interval.

Train providers in the Best Practices interventions to impact modifiable risk factors for low birth weight

Prenatal health care providers should be trained to provide culturally competent client education and counseling around weight gain, smoking cessation, and prevention of preterm birth and premature rupture of the membranes. Best Practices information should be easily accessible (practice guides/monographs, educational modules, Web-based materials, continuing education presentations) to assist providers in incorporating proven techniques.

Incorporate behavioral and lifestyle counseling into the content of prenatal care

Providers should be encouraged by peers, professional societies, and health care payors to incorporate counseling relative to nutrition, weight gain, and smoking cessation into their routine practice. Conducting focus groups with prenatal care providers may elicit barriers to incorporating client counseling and education about weight gain and smoking cessation into standard prenatal care.

Encourage and fund multidisciplinary approaches to risk reduction during pregnancy

Registered dietitians and smoking cessationists should be available to prenatal health care providers and their services should be reimbursed by payors. The Colorado Prenatal Plus Program has demonstrated effectiveness in reducing low birth weight and decreasing the incidence of smoking and inadequate weight gain among program participants (53). Pregnant women followed under a nurse home visitation model have shown higher rates of prenatal smoking cessation (62). Cost-benefit/cost effectiveness information, similar to the data compiled by Prenatal Plus and the nurse home visitation program can be used to demonstrate the effectiveness of these models to both prenatal providers and payors.

Educate consumers about modifiable risk factors for and consequences of low birth weight

A sense of urgency about the problem of low birth weight in Colorado must be communicated to all Coloradans. Social marketing can be utilized to focus attention on this issue and to raise awareness among the general population about the prevalence and consequences of low birth weight. Consumers

should also be educated about treatable risk factors that contribute to low birth weight such as the importance of preconception care and planning, maintaining healthy interpregnancy intervals, adequate weight gain during pregnancy, the risks of smoking, the importance of screening for lower genital tract infections, and signs, symptoms, and risks of preterm labor.

Convene a task force to study the implications of assisted reproductive technology on low birth weight in Colorado

A task force to discuss practice issues relative to assisted reproduction may lead practitioners to adopt voluntary guidelines regarding the use of this technology.

These solutions present broad action steps to guide the efforts of a variety of stakeholders interested in addressing the problem of low birth weight in Colorado. Specific interventions are outlined on the following pages for health care providers, policymakers, childbearing-age women, and health care payors.

What HEALTH CARE PROVIDERS can do about Low Birth Weight...

Emphasize that low birth weight is a critical problem that can be decreased through risk reduction.

Multiple Gestation

- Counsel couples about the risks, benefits, and treatment options for infertility
- Counsel women accessing assisted reproductive technology (ART) about the possible outcomes of ART, including the likelihood, risks, and potential long-term consequences of multiple birth

Inadequate Weight Gain

- Counsel about nutrition and weight issues prior to pregnancy
- Use the Institute of Medicine's Guidelines for Weight Gain during Pregnancy
- Calculate a pregnant woman's BMI and discuss target weight gain range during pregnancy, with special attention to teens and women who are underweight at the initial visit
- Counsel all pregnant women, utilizing culturally appropriate messages, about nutrition and weight gain during pregnancy
- Follow the woman's rate of weight gain and total amount of weight gained during pregnancy
- Refer women who are underweight prior to pregnancy to a registered dietitian at the first prenatal visit
- Refer women with inadequate weight gain to an registered dietitian by the second prenatal visit

Smoking

- Develop a personal commitment to helping childbearing-age and pregnant women stop smoking
- Counsel all women about the health risks of smoking, including environmental tobacco smoke
- Assess readiness for quitting and encourage smoking cessation prior to pregnancy
- Ask every pregnant woman about her smoking status initially and at every prenatal encounter
- Implement a tobacco-user identification system in the prenatal record
- Inform women that cessation, not reduction, is associated with the best reduction in low weight births
- Provide, along with all other personnel who come into contact with pregnant women, a brief counseling session to promote smoking cessation at every prenatal and postpartum contact
- Use pregnancy-related motivational messages to enhance cessation
- Provide follow-up and pharmacologic therapy (as needed) to maintain postpartum smoking cessation
- Refer clients to case management/home visitation programs proven to assist in smoking cessation

Premature Rupture of the Membranes (PROM)

- Identify women at risk for preterm PROM
- Educate all pregnant women about the signs and symptoms of preterm labor
- Screen and treat pregnant women for lower genital tract infections early in pregnancy
- Follow steps for preventing preterm birth from the Colorado Premature Birth Prevention Project

Onset of Prenatal Care

- Emphasize the importance of early prenatal care
- Schedule women for prenatal care in the first trimester of pregnancy

Interpregnancy Interval

- Promote access to and consistent use of contraception, including emergency contraception
- Emphasize the health benefits of increasing the interpregnancy interval to at least 18 months

What POLICYMAKERS can do about Low Birth Weight...

Communicate to the public that low birth weight is a critical problem in Colorado that can be decreased through risk reduction.

Multiple Gestation

- Convene a task force to study the implications of assisted reproductive technology (ART)
- Explore the feasibility of insurance coverage for ART

Inadequate Weight Gain

- Promote positive messages about weight and body image among both male and female adolescents
- Promote the use of the Institute of Medicine guidelines as the standard for nutrition counseling during pregnancy
- Support/direct the development of community education/social marketing campaigns to inform consumers about the importance of weight gain during pregnancy
- Advocate/support multidisciplinary approaches to prenatal care

Smoking

- Support/direct the development of community education/social marketing campaigns to inform consumers about the risks of smoking during pregnancy and environmental tobacco exposure
- Support/direct the development of a smoking cessation hotline to provide 24-hour, 7-day-per-week assistance and support for smokers trying to quit
- Support/promote the use of Best Practice recommendations for smoking cessation during pregnancy
- Support/advocate for multidisciplinary approaches to smoking cessation during pregnancy

Premature Rupture of the Membranes (PROM)

- Join in the efforts of the Colorado Premature Birth Prevention project to educate consumers about the risks and signs/symptoms of preterm labor
- Promote current Best Practice recommendations for preventing premature rupture of the membranes (PROM)

Onset of Prenatal Care

- Promote/support access to prenatal care for all women
- Support/direct efforts to raise the Medicaid eligibility rate for pregnant women

Interpregnancy Interval

- Support/direct the development of community education campaigns about the benefits of pregnancy spacing
- Support widespread access to contraception, including emergency contraception

What CHILDBEARING-AGE WOMEN can do about Low Birth Weight...

Realize that low birth weight is an important risk that can be reduced by adopting or maintaining a healthy lifestyle.

Multiple Gestation

- Seek comprehensive information about infertility treatment
- Become knowledgeable about the risks as well as the benefits of assisted reproductive technology and multiple birth

Inadequate Weight Gain

- Work to develop a healthy body image
- Be knowledgeable about body mass index (BMI) measurements and the amount of weight that should be gained during pregnancy
- Understand that weight must be gained during pregnancy in order to have a healthy baby
- Make a commitment to eat a healthy diet during pregnancy

Smoking

- Quit smoking prior to pregnancy
- Make a commitment to being smoke-free during and after pregnancy
- Be honest with providers about tobacco use prior to and during pregnancy
- Get partners and family members involved and committed to smoking cessation
- Seek assistance from providers and support systems for smoking cessation
- Avoid environmental tobacco smoke

Premature Rupture of the Membranes

- Request screening for lower genital tract infections early in pregnancy
- Be aware of the signs and symptoms of preterm labor

Onset of Prenatal Care

- Access prenatal care early in pregnancy

Interpregnancy Interval

- Make a commitment to consistently use contraception
- Plan pregnancy and wait at least 18 months between delivery and subsequent conception

What PAYORS can do about Low Birth Weight...

Support strategies that reduce the critical problem of low birth weight through risk reduction.

Multiple Gestation

- Reimburse infertility treatment, including assisted reproductive technology
- Work with providers to establish guidelines for assisted reproductive technology, including embryo transfer

Inadequate Weight Gain

- Encourage/reimburse multidisciplinary approaches to prenatal care

Smoking

- Inform enrollees about the risks of smoking and encourage cessation for all childbearing-age women
- Provide reimbursement to providers for smoking cessation counseling and follow-up
- Provide reimbursement for over-the counter pharmacologic therapy for smoking cessation

Premature Rupture of the Membranes

- Discuss guidelines for screening pregnant women for lower genital tract infections with providers
- Join the Colorado Premature Birth Prevention project to educate consumers about the risks and signs/symptoms of preterm labor
- Promote current Best Practice recommendations for preventing premature labor and birth

Interpregnancy Interval

- Provide reimbursement for all contraceptive methods
- Emphasize the importance of pregnancy planning and spacing

Conclusions

The problem of low birth weight in Colorado is significant. The state's low birth weight rate is one of the highest in the nation, and the rate has remained above the U.S. rate for the last fifty years. This report reveals that the major factors contributing to Colorado's high low birth weight rate are multiple births, inadequate weight gain, smoking, and premature rupture of the membranes; factors which can be altered. Solutions lie in promoting proven strategies to impact each one of these potentially treatable risk factors.

Solutions include decreasing the incidence of multiple gestation by reducing the likelihood that assisted reproductive techniques will result in multiple births; assuring that all pregnant women have appropriate nutrition information and monitoring to gain an adequate amount of weight; assisting all women to stop smoking prior to conception or during pregnancy; ensuring that all pregnant women at risk for lower genital tract infections are screened and treated early in pregnancy; and increasing client awareness of the signs and symptoms of preterm labor.

Health care providers, policymakers, childbearing-age women, and payors all have a role to play in reducing Colorado's low birth weight rate. All must realize that low birth weight is a critical problem that can be decreased through risk reduction. Solutions are at hand, which require putting into practice on a broad scale the recommendations discussed in this report. Statewide commitment to these strategies, supported by all stakeholders, can result in a decrease in the low birth weight rate in Colorado to a level close to the Healthy People 2000/2010 goal of 5.0 percent.

Appendix A

Low Birth Weight Rate Ranking of States, 1997 Percentage of Births that are Low Weight

All Races		White Mothers	
United States	7.5	United States	6.5
District of Columbia	13.4	Wyoming	9.0
Louisiana	10.2	Colorado	8.5
Mississippi	10.1	West Virginia	8.1
Alabama	9.2	New Mexico	7.8
South Carolina	9.2	Alabama	7.4
Wyoming	9.0	Kentucky	7.4
Colorado	8.8	Mississippi	7.4
Georgia	8.8	Tennessee	7.4
Maryland	8.8	Arkansas	7.2
North Carolina	8.8	North Carolina	7.1
Tennessee	8.8	Indiana	7.0
Delaware	8.7	Louisiana	7.0
Arkansas	8.4	Nevada	7.0
West Virginia	8.3	Arizona	6.9
Florida	8.0	Delaware	6.9
Illinois	7.9	Rhode Island	6.9
Indiana	7.9	Florida	6.8
New Jersey	7.9	Oklahoma	6.8
Kentucky	7.8	South Carolina	6.8
New York	7.8	Missouri	6.7
New Mexico	7.8	Nebraska	6.7
Michigan	7.7	New York	6.7
Missouri	7.7	Ohio	6.7
Ohio	7.7	Georgia	6.6
Virginia	7.7	Massachusetts	6.6
Nevada	7.6	Connecticut	6.5
Pennsylvania	7.6	Michigan	6.5
Rhode Island	7.4	New Jersey	6.5
Connecticut	7.3	Pennsylvania	6.5
Oklahoma	7.3	Texas	6.5
Texas	7.3	Utah	6.5
Hawaii	7.2	Illinois	6.4
Massachusetts	7.0	Kansas	6.4
Nebraska	7.0	Maryland	6.4
Arizona	6.9	Idaho	6.3
Kansas	6.9	Vermont	6.3
Utah	6.6	Iowa	6.2
Iowa	6.4	North Dakota	6.2
Wisconsin	6.4	Virginia	6.2
Idaho	6.3	Montana	6.1
Montana	6.3	District of Columbia	5.9
Vermont	6.3	Maine	5.9
California	6.2	New Hampshire	5.9
North Dakota	6.2	California	5.6
Alaska	5.9	South Dakota	5.6
Maine	5.9	Wisconsin	5.6
Minnesota	5.9	Alaska	5.5
New Hampshire	5.8	Minnesota	5.5
Washington	5.6	Oregon	5.3
South Dakota	5.5	Washington	5.3
Oregon	5.5	Hawaii	5.1

The District of Columbia had the highest (worst) low birth weight (LBW) rate in 1997, with 13.4% of all its births weighing 5 lbs., 8 oz., or less. Colorado had the second highest LBW rate for white women, with 8.5% of births weighing 5 lbs., 8 oz., or less.

The Colorado low birth weight rate shown here, 8.8%, differs slightly from Colorado Vital Statistics final data of 8.9%. Source: Table 46, "Births: Final Data for 1997," National Vital Statistics Reports, National Center for Health Statistics, 4/29/99, Vol. 47, Number 18.

Appendix B

Multiple Births in Colorado, 1975 to 1997

Year	Total Births	Total Multiple Births	Percent Multiple Births	Total LBW Births	LBW Multiple Births	Percent LBW Multiple Births
1975	40,148	763	1.9%	3,622	476	13.2%
1980	49,716	945	1.9%	4,090	534	13.1%
1985	55,115	1,166	2.1%	4,257	654	15.4%
1990	53,491	1,246	2.3%	4,286	731	17.1%
1995	54,310	1,641	3.0%	4,613	973	21.1%
1996	55,779	1,730	3.1%	4,941	1,072	21.7%
1997	56,505	1,729	3.1%	5,014	1,056	21.1%

In 1975, there were a total of 763 multiple births to Colorado residents. In 1997, the number had grown to 1,729, an increase of 127 percent. During that time period, the number of births in the state increased from 40,148 to 56,505, an increase of 41 percent.

Multiple births comprised 1.9 percent of all births in 1975 and 1980. During the following decade, the proportion grew to 2.3 percent. After 1990, the proportion grew rapidly to 3.0 percent in 1995 and 3.1 percent in 1996 and 1997.

The number of low weight births in the state in 1975 was 3,622, of which 476, or 13.2 percent, were multiple births. By 1997, the number of low weight births had increased by 38 percent to 5,014, and the number of LBW multiple births had grown to 1,056, an increase of 122 percent.

In 1975 in Colorado, only one of every eight low weight births was a multiple birth, i.e., a twin (or triplet or quadruplet). In 1997 and 1998, more than one out of every five low weight births was a multiple birth.

Appendix C

Institute of Medicine Recommendations for Total Weight Gain During Pregnancy

To determine the recommended weight gain for pregnant women, the Institute of Medicine's National Academy of Sciences Subcommittee on Nutritional Status and Weight Gain During Pregnancy uses body mass index (BMI) as the standard for weight-for-height categories.

All women, regardless of race or age, should follow the weight gain recommendations listed below:

Pre-pregnancy BMI	Recommended Total Weight Gain
Low < 19.8	28-40 pounds
Normal = 19.8-26.0	25-35 pounds
High = 26.1-29.0	15-25 pounds
Obese > 29.0	15 pounds

Recommendations for Rate of Weight Gain During Pregnancy

Use an appropriate weight gain chart to show the range and rate of weight gain recommended.

Prepregnancy BMI	Recommended Rate of Weight Gain
Low < 19.8	Slightly more than 1 pound/week
Normal = 19.8-26.0	Approximately 1 pound/week
High = 26.1-29.0	2/3 pound/week

References:

Institute of Medicine, National Academy of Sciences, *Nutrition During Pregnancy: Weight Gain, Nutrient Supplements*, National Academy Press, Washington, D.C., 1990.

Suitor, C.W.: *Maternal Weight Gain: A Report of an Expert Work Group*, Arlington, VA: National Center for Education in Maternal and Child Health, 1997.

References

1. Hack, M., Klein, N.K., Taylor, H.G.: Long-term developmental outcomes of low birth weight infants, *Future Child* 5, 1995; 1:176-96.
2. Schendel, D.E., Stockbauer, J.W., Hoffman, H.J. et al.: Relation between very low birth weight and developmental delay among preschool children without disabilities, *American Journal of Epidemiology*, 1997; 146(9): 740-9.
3. National Center for Health Statistics: Births: Final data for 1997, *National Vital Statistics Reports*, April 29, 1999; 47: Number 18, Table 46.
4. Egbert, M., Meng, C., Garrett, C., McGregor, J.: Using GIS in conjunction with logistic regression models – A case study: Mapping low weight births in Colorado, Health Statistics and Vital Records, Colorado Department of Public Health and Environment, April 3, 1998.
5. Sexton, M., Hebel, J.R.: A clinical trial of change in maternal smoking and its effect on birth weight, *Journal of the American Medical Association*, 1984; 251: 911-15.
6. Kleinman, J. C., Kessel, S. S.: Racial differences in low birth weight: Trends and risk factors, *New England Journal of Medicine* 1987; 317: 749-54.
7. Cnattingius, S., Bergstrom, R., Lipworth, L., Kramer, M.S.: Pre-pregnancy weight and the risk of adverse pregnancy outcomes, *New England Journal of Medicine*, 1998; 338:147-52.
8. French, J.: Reducing low birthweight in Colorado: Population attributable fraction for known risk factors for low birthweight among singleton births, prepared for the Family and Community Health Services Division and Health Statistics and Vital Records Division, Colorado Department of Public Health and Environment from 1995-1997 Birth Record Data, September 24, 1999.
9. Jensen, G.W., and Moore, L.G.: The effect of high altitude and other risk factors on birthweight: Independent or interactive effects? *American Journal of Public Health*, June 1997; 87(6): 1003.
10. Martin, J., et al.: Trends in twin and triplet births: 1980-1997. *National Vital Statistics Reports*, September 14, 1999, 47(24): 1-16.
11. Templeton, A., Morris, J.K.: Reducing the risk of multiple births by transfer of two embryos after in-vitro fertilization, *New England Journal of Medicine*, 1998; 339: 573-77.
12. Porreco, Richard C.: A guest editorial: Perinatal costs of assisted reproductive technology, *Obstetrical and Gynecological Survey*, 1998; 53 (7): 393-94.
13. Institute of Medicine, National Academy of Sciences: *Nutrition during pregnancy: Weight gain, nutrient supplements*, Washington, D.C: National Academy Press, 1990.

-
14. Sutor, C.W.: *Maternal weight gain: A report of an expert work group*, Arlington, VA: National Center for Education in Maternal and Child Health, 1997.
 15. Colorado Department of Public Health and Environment, Health Statistics Section, Colorado Pregnancy Risk Assessment Monitoring System Data, 1997-1998.
 16. Kleinman, J.C, et al.: The effects of maternal smoking on fetal and infant mortality, *American Journal of Epidemiology*, 1988; 127: 274-282.
 17. American College of Obstetricians and Gynecologists: Smoking and women's health, Washington, D.C.: ACOG Educational Bulletin 240, 1997.
 18. Milberger, S., et al.: Is maternal smoking during pregnancy a risk factor for attention deficit hyperactivity disorder in children? *American Journal of Psychiatry*, 1996; 153: 1138-1142.
 19. Taylor, J.A., Sanderson, M.: A re-examination of the risk factors for sudden infant death syndrome, *Journal of Pediatrics*, 1995; 126: 887-891.
 20. Aligne, C.A., Stoddard, J.J.: Tobacco and children: An economic evaluation of the medical effects of parental smoking, *Archives of Pediatric and Adolescent Medicine*, 1997; 151: 648-653.
 21. Sherril, D.L., Martinez, F.D., Lebowitz, M.D., et al.: Longitudinal effects of passive smoking on pulmonary function in New Zealand children, *Am Rev of Respiratory Disease*, 1992; 145: 1136-41.
 22. Centers for Disease Control and Prevention, Medical care expenditures attributable to cigarette smoking during pregnancy – United States, *Morbidity and Mortality Weekly Report*, 1995; 46: 1048-50.
 23. Neslon, D.E., et al.: Trends in smoking among U.S. adolescent's 1974 through 1991, *American Journal of Public Health*, 1995; 85: 34-40.
 24. Garite, T.: Premature rupture of the membranes, IN: Creasy, R.and Resnick, R., *Maternal-fetal medicine*, Philadelphia: W.B. Saunders & Co., 1999, 644-58.
 25. Kaltreider, D.F., et al.: Epidemiology of preterm delivery, *Clinical Obstetrics and Gynecology*, 1980; 23: 17.
 26. Lonky, N.M., Hayashi, R.H.: A proposed mechanism for premature rupture of membranes, *Obstetrical and Gynecology Survey*, 1988; 43: 22.
 27. Edwards, L.E., Barrada, M.I., Haaman, A.A., et al.: Gonorrhoea in pregnancy, *American Journal of Obstetrics and Gynecology*, 1978; 132: 637.

-
28. Regan, T.A., Chao, S., James, L.S.: Premature rupture of membranes, preterm delivery and group B streptococcal colonization of mothers, *American Journal of Obstetrics and Gynecology*, 1981; 141: 184.
 29. Martin, D.H., Koutsky, L., Eschenbach, D.A., et al.: Prematurity and perinatal mortality in pregnancies complicated by chlamydia trachomatis infections, *Journal of the American Medical Association*, 1982; 247: 1585.
 30. Minkhoff, H., Grunebaum, A.N., Schwarz, R.H., et al.: Risk factors for prematurity and premature rupture of membranes: A prospective study of vaginal flora in pregnancy, *American Journal of Obstetrics and Gynecology*, 1984; 150: 965.
 31. McGregor, J.A., et al.: Prevention of premature birth by screening and treatment of common genital tract infections: Results of a prospective, controlled evaluation, *American Journal of Obstetrics and Gynecology*, 1995; 173: 157-67.
 32. Hillier, S., et al.: Association between bacterial vaginosis and preterm delivery of a low birth-weight infant, *New England Journal of Medicine*, 1995; 333: 1737-42.
 33. Mc Gregor, J., et al.: Evidence-Based Prevention of Preterm birth and rupture of membranes: Infection and inflammation, *Journal SOGC*; 1997; 835-52.
 34. Hauth, J.C., et al.: Reduced incidence of preterm delivery with metronidazole and erythromycin in women with bacterial vaginosis, *New England Journal of Medicine*, 1995; 333: 732-736.
 35. French, J.I., et al.: Increased risk for preterm birth among African-American women: Effects of common reproductive tract infections and benefits of treatment, (submitted for publication, 1999).
 36. Carey, J.C., Klebanoff, M.A., Hauth, J.C., et al.: Metronidazole to prevent preterm delivery in pregnant women with asymptomatic bacterial vaginosis, *New England Journal of Medicine*, 2000; 342(8): 534-40.
 37. Lamont, R.F.: Antibiotics for the prevention of preterm birth, *New England Journal of Medicine*, 2000; 342 (8): 581-82.
 38. Centers for Disease Control and Prevention, 1998 guidelines for the treatment of sexually transmitted diseases, *MMWR: Morbidity and Mortality Weekly Report*, 1998; 47 (RR-1):71.
 39. Zhu, B.P., Rolfs, R.T., Nangle, B.T., Horan, J.M.: Effects of the interval between pregnancies on perinatal outcome, *New England Journal of Medicine*, 1999; 340: 589-94.
 40. American College of Obstetricians and Gynecologists: Multiple gestation means multiple risks, *ACOG Today*, 1999; 43(4): 1-12.

-
41. Rosenthal, M. B.: Infertility, IN: Rosenfeld, J. A., *Women's Health in Primary Care*, Baltimore: Williams & Wilkens, 1997; 351-62.
 42. Centers for Disease Control and Prevention, et al.: *1996 Assisted Reproductive Technology Success Rates*, Washington, D.C.: U.S. Department of Health and Human Services, 1998.
 43. American College of Obstetricians and Gynecologists: Nonselective embryo reduction: Ethical guidance for the obstetrician-gynecologist, ACOG Committee Opinion, 1999; 215: 1-4.
 44. Bergh, T., Ericson, A., Hillensj, O.T., Nygren, K-G., Wennerholm, U-B.: Deliveries and children born after in-vitro fertilization in Sweden 1982-1995: A retrospective cohort study, *The Lancet*, 1999; 354: 1579-85.
 45. New York State Task Force on Life and the Law: *Assisted Reproductive Technologies: Analysis and Recommendations for Public Policy*, New York, N.Y.: New York State Task Force on Life and the Law, 1998.
 46. Jones, H.W.: Twins or more, *Fertility and Sterility*, 1995; 63: 701.
 47. American Society for Reproductive Medicine: *Guidelines on number of embryos transferred*, Birmingham, Alabama: ASRM, 1998.
 48. Schieve, L.A., et al.: Live-birth rates and multiple birth risk using in-vitro fertilization, *Journal of the American Medical Association*, 1999; 282 (19): 1832-38.
 49. Gardner, D.K., et al.: Culture and transfer of human blastocysts increases implantation rates and reduces the need for multiple embryo transfers, *Fertility and Sterility*, 1998; 169: 84-88.
 50. Schieve, L.A., Cogswell, M.E., Scanlon, K.S.: An empiric evaluation of the Institute of Medicine's pregnancy weight gain guidelines by race, *Obstetrics and Gynecology*, 1998; 91(6): 878-84.
 51. Siega-Riz, A.M., Adair, L.S., Hobel, C.J.: Institute of Medicine maternal weight gain recommendations and pregnancy outcome in a predominately Hispanic population, *Obstetrics and Gynecology*, 1994; 84 (4): 565-73.
 52. Taffel, S.M., Keppel, K.G., Jones, G.K.: Medical advice on maternal weight gain and actual weight gain: Results from the 1988 national maternal and infant health survey, *Annals of the New York Academy of Sciences*, 1993; 678: 293-305.
 53. Women's Health Section, Colorado Department of Public Health and Environment, *Prenatal Plus Annual Report, Year Three: January-December 1998*, October 1, 1999, Available at

54. Cogswell, M.E., Scanlon, K.S., Fein, S.B., Schieve, L.A.: Medically advised, mother's personal target and actual weight gain during pregnancy, *Obstetrics and Gynecology*, 1999; 94 (4): 616-22.
55. Cnattingius, S., Bergstrom, R., Lipworth, L., Kremer, M.S.: Pre-pregnancy weight gain and the risk of adverse pregnancy outcomes, *New England Journal of Medicine*, 1998; 338: 147-152.
56. Smoke-Free Families: Innovations to stop smoking during and beyond pregnancy, Call for proposals, The Robert Wood Johnson Foundation, 1-14.
57. Consensus workshop on smoking cessation during pregnancy sponsored by the Robert Wood Johnson Foundation and the Smoke-Free Families Program in collaboration with the Health Resources and Services Administration and the Centers for Disease Control and Prevention, Rockville, MD, April 9-10, 1998.
58. Zapka, J.G., Ebert, L., Stoddard, A.M., Ockene, J.K., Goins, K.V., Bonollo, D.: Smoking cessation counseling with pregnant and postpartum women: A survey of community health center providers, *American Journal of Public Health*, 2000; 90 (1): 78-84.
59. Piper, J.M., Mitchel, E.F., Snowden, M., Hall, C., Adams, M., Taylor, P.: Validation of 1989 Tennessee birth certificates using maternal and newborn hospital records, *American Journal of Epidemiology*, 1993; 137: 758-68.
60. Buescher, P.A., Taylor, K.P., Davis, M.P., Bowling, M.: The quality of the new birth certificate data: A validation study in North Carolina, *American Journal of Public Health*, 1993; 83: 1163-5.
61. Benowitz, N.L.: Nicotine replacement therapy during pregnancy, *Journal of the American Medical Association*, 1991; 266: 3174-77.
62. Ogburn, P.L., Hurt, R.D., Croghan, I.T., et al.: Nicotine patch use in pregnant smokers: Nicotine and cotinine levels and fetal effects, *American Journal of Obstetrics and Gynecology*, 1999; 181(3): 736-43.
63. Olds, D., et al.: Improving the delivery of prenatal care and outcomes of pregnancy: A randomized trial of nurse home visitation, *Pediatrics*, 1986; 77: 16-28.
64. Lightwood, J.M., Phibbs, C.S., Glantz, S.A.: Short-term health and economic benefits of smoking cessation: Low birth weight, *Pediatrics*, 1999; 104 (6): 1312-20.
65. Ershoff, D.H., et al.: Pregnancy and medical cost outcomes of a self-help prenatal smoking

cessation program in an HMO, *Public Health Reports*, 1990; 1340-7.

66. Marks, J.S., et al: A cost-benefit/cost-effectiveness analysis of smoking cessation for pregnant women, *American Journal of Preventive Medicine*, 1990; 6: 282-9.
67. Institute of Medicine: *The Best Intentions: Unintended Pregnancy and the Well-Being of Children and Families*, Washington, D.C: National Academy Press, 1995.