

# Prevention: Strong Investments in Colorado's Health

Supplement of the 2011 Colorado Health Report Card



The Colorado

Health  
Report  
Card supplement



The Colorado Health Foundation™



# Prevention: Strong Investments in Colorado's Health

Current budgetary constraints spark much discussion about reducing public and private resources dedicated to health care services. Individuals want affordable health insurance and manageable out-of-pocket medical expenses. Employers want to reduce the growth of insurance premiums and increase productivity by keeping their employees healthy. Legislators want to care for individuals enrolled in Medicaid while working to slow the growing expenditures related to the program.

The financial downturn amplifies the importance of finding ways to cut costs and reduce demand for health care services. While maintaining and improving the quality of health care is an important factor in containing costs, prevention can reduce costs and demand for services while improving health. For these reasons, a clear understanding of the promise of prevention is key to garnering support for public health interventions among community leaders and policymakers.

The research is clear: investing in evidence-based public health programs could substantially reduce health care costs in Colorado. One study estimates that an annual investment of \$10 per Coloradan in community-based prevention initiatives could save more than \$232 million annually in health care costs after five years — a \$5.05 return for every \$1 invested.<sup>1</sup> Despite this potential for cost savings, public health represents a small portion (less than 5 percent) of every dollar spent on health care in the United States.

The 2011 Colorado Health Report Card supplement highlights prevention initiatives that align with Report Card indicators. The selected initiatives realize cost savings, while maintaining quality. The supplement also profiles the impact of these initiatives on Coloradans and identifies opportunities for future investments as well.



An annual investment of \$10 per Coloradan in community-based disease prevention initiatives could save more than \$232 million annually in health care costs after five years.

## Does Prevention Save Money?

Public health is defined as the “practice of preventing disease and promoting good health within groups of people, from small communities to entire counties.”<sup>2</sup> In contrast, health *care* focuses on the improvement of health in individuals through the provision of medical services. In theory, public health initiatives that seek to *prevent* disease should be less costly than *treating* a more advanced disease.

In practice, however, this theory is more complicated. Many studies have tackled the question of whether prevention measures reduce health care costs in the long term. The answer? Some, but not all.<sup>3</sup> For example, vaccinating children and prescribing aspirin for some adults at high risk for heart disease have shown to improve health and reduce costs.<sup>4</sup> A recent study in the journal *Health Affairs* suggests that if 90 percent of the U.S. population adopted these and 18 other proven prevention strategies, annual health costs could decline by \$3.7 billion and more than two million lives could be saved.<sup>5</sup> Other preventive measures, however, such as screening for prostate cancer in men ages 75 years and older,<sup>6</sup> may cost more money than they save and may lead to other adverse effects.

The prevention interventions included in this supplement are “evidence-based,” supported by a substantive body of research demonstrating their effectiveness at improving health and reducing costs. It’s important to note that this supplement provides a sampling by lifestage, not a comprehensive list, of cost-saving prevention initiatives. The programs highlighted in this report were chosen by the research team at the Colorado Health Institute and reviewed by local content experts, including those at the Colorado Department of Public Health and Environment. All selected initiatives are shown to reduce or eliminate significant costs, according to a sizable body of evidence. The conditions and diseases that can result from lack of attention to Report Card indicators such as obesity pose a large economic burden on the state, and interventions addressing them may reduce or eliminate significant costs.





## Vaccinations: A return on investment success story

A recent study compared the economic burden of *not* vaccinating children with the costs of vaccinating them.<sup>7</sup> Using disease rates from the pre-vaccine era, researchers estimated how many children would have contracted measles, mumps and other diseases had they not been vaccinated, and what the costs of these diseases would have been. These costs included direct health care costs — expenses related to treatment and complications — as well as indirect costs, such as lost productivity a parent would experience when caring for a sick child.

Researchers compared these costs to those associated with vaccination. First was the costs of the vaccine itself — the time a caregiver needed to bring the

child in for vaccination and the expense of treating any adverse reactions. Second, because vaccines aren't 100 percent effective, there were costs associated with the small percentage of children who contracted the disease despite being vaccinated.

Using this framework, researchers evaluated the costs and benefits of vaccinating children using the seven-vaccine series recommended by the Centers for Disease Control and Prevention. They found that from 1995-2001, vaccines saved \$9.9 billion in direct costs and \$43.3 billion in indirect or societal costs. Or, for every dollar invested, the vaccine series saved more than \$5 in direct costs and about \$11 in additional costs to society.

## A Roadmap to Featured Initiatives

	Initiative	Colorado Spotlight
Healthy Beginnings	Prenatal home visitation programs	Invest in Kids / Nurse-Family Partnership
Healthy Children	Preventive oral health care	Cavity Free at Three
Healthy Adolescents	Tobacco use: Prevention and cessation	Colorado N-O-T Program
Healthy Adults	Workplace wellness programs	LiveWell Colorado
Healthy Aging	Adult vaccinations	Centura Health



For every dollar invested in the Nurse-Family Partnership program, \$1.26 to \$5.70 was returned to society.

## Healthy Beginnings Prenatal Nurse Home Visitation

Low-income women are at a higher risk of poor birth outcomes. The 2011 Colorado Health Report Card finds that low-income Colorado mothers are more likely to smoke during pregnancy than high-income mothers. Cigarette exposure during pregnancy can result in pre-term births and low birth-weight babies.<sup>8</sup> Prenatal home visitation programs target several risk factors, such as cigarette smoking, to improve the health of children born to at-risk mothers.

Home visitation nurses help participating pregnant women improve their health behaviors and nutrition to increase their chances of delivering a healthy baby. After delivery, the nurses work with mothers on how to care for infants and toddlers properly. A literature review published in early 2011 indicated that women who have prenatal nurse home visits also are more likely to receive prenatal care in a clinician's office.<sup>9</sup> Other studies found that nurse home visitation programs are associated with an improvement in the home environment<sup>10</sup> and a reduction in subsequent pregnancies, cigarette smoking and reliance on public assistance.<sup>11,12</sup> Children whose mothers received home visits from nurses demonstrated higher intellectual functioning and fewer behavioral problems than a control group of children.<sup>13</sup>

The Nurse-Family Partnership is one such home visitation program currently being replicated in 34 states, including Colorado. NFP connects at-risk, first-time mothers and their babies with trained registered nurses. Pregnant women receive weekly or biweekly visits from a nurse who provides care and support to help them deliver healthy babies and develop parenting skills. These visits occur from early pregnancy until the child's second birthday, allowing time for the nurse to form a relationship with a mother and to encourage a healthy home life from a position of trust.<sup>14</sup>

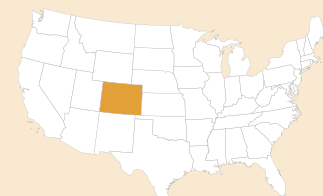
NFP is based on the ground-breaking work of David Olds, professor of pediatrics, psychiatry and preventive medicine at the University of Colorado, Denver. The program is validated by almost 30 years of research demonstrating improvement in the health of first-time mothers and their children. One of the program's first



evaluations in Denver determined that participating women were less likely to smoke during pregnancy and interacted more with their babies who demonstrated greater language and mental development than non-participants.<sup>15</sup> According to another evaluation, the program helps prevent child mistreatment, neglect and associated injury.<sup>16</sup> Even by the age of 19, teens who received home visits as children were less likely to be arrested, gave birth to fewer children and used Medicaid less frequently than their counterparts who did not benefit from NFP.<sup>17</sup>

### *Return on Investment*

An analysis by the RAND Corporation found that for every dollar invested in the NFP program, \$1.26 to \$5.70 was returned to society. The return occurred mostly from reduced governmental spending on benefits such as Supplemental Nutrition Assistance Program (food stamps) and Medicaid.<sup>18</sup> A 2011 study from the Washington State Institute for Public Policy found that the program returned \$3.23 for every dollar spent.<sup>19</sup>



## Colorado Spotlight

### *Invest in Kids*

Invest in Kids partners with local communities to implement the NFP model in Colorado. The Colorado NFP delivered a 20 percent reduction in smoking by pregnant women, decreased pre-term and low birth-weight rates and decreased instances of domestic violence. Participation has also led to more mothers completing a General Educational Development certificate (equivalent to a high school diploma) and securing employment. Infants born to Colorado mothers participating in NFP are less likely to be born pre-term or at a low birth weight and have higher immunization rates. Invest in Kids has served more than 13,000 Coloradan families using the NFP model since 1999.<sup>20</sup>



# Healthy Children

## Preventive Oral Health Care

In 2005, children missed nearly 8 million hours of school annually in Colorado due to acute oral pain and infection.

23%

of Colorado's children did not receive a preventive dental visit within the last year

Tooth decay remains one of the most common threats to childhood health. In 2005, the Colorado Department of Public Health and Environment reported that children missed nearly 8 million hours of school annually in Colorado due to acute oral pain and infection.<sup>21</sup> Preventive dental care, including dental visits, sealants and fluoridation, has been shown to reduce the prevalence of oral disease among children, saving money in the long term.<sup>22,23</sup> Despite the importance of preventive dental visits, however, the 2011 Colorado Health Report Card finds that 23 percent of Colorado's children did not receive a preventive visit within the last year.

Fluoride can help prevent decay by making teeth more resistant to mouth bacteria. It can be delivered topically or through the water supply. Topically applied fluoride is delivered routinely in a dentist's or physician's office.<sup>24</sup>

Community water fluoridation has been recognized by the Centers for Disease Control and Prevention as one of the "10 great public health achievements" of the 20th century. This recognition comes primarily from the large body of evidence supporting water fluoridation as a safe, equitable and cost-effective way to reduce cavities.<sup>25</sup> In Colorado, however, only 71 percent of residents on public water systems received fluoridated water in 2008.<sup>26</sup> This rate is slightly lower than the United States average of 72 percent.<sup>27</sup>

### *Return on Investment*

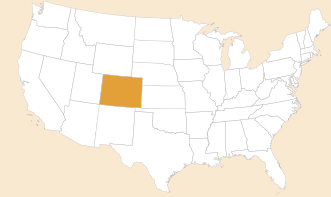
A study published in the *Journal of Public Health Dentistry* found that community water fluoridation saved money in all cases when compared to the costs of restorative dental care. The average American living in a small community saved approximately \$16 per year in dental treatment costs. For Americans living in larger communities, the annual per-person cost savings was nearly \$19 per year. In these larger communities, where water fluoridation costs approximately 50 cents per person, every \$1 invested yielded approximately \$38 in savings.<sup>28</sup> In Colorado, one study estimated





that \$46.6 million would be saved annually if community water fluoridation programs were implemented in the 52 water systems currently without such programs.<sup>29</sup>

A seminal article published in *Pediatrics* found that Medicaid-enrolled children who had an early preventive dental visit were more likely to receive subsequent preventive services and therefore generate lower oral health expenditures. Average cumulative dental expenditures for children who received an oral health visit at age 1 were \$262 during the five years of the study; average expenditures for children who received their first oral health visit at ages 4 or 5 were \$546 during the same five-year period.<sup>30</sup>



## Colorado Spotlight

### *Cavity Free at Three*

Cavity Free at Three (CF3), established in 2006, is an early childhood cavity prevention program for low-income mothers, their babies and toddlers. The evidence-based program works to prevent transmission of bacteria from mother to child through education and oral health care for children up to 3 years. CF3 increases at-risk mothers' access to cavity detection services and provides technical assistance to health care providers such as pediatricians and family physicians so they can conduct oral health screenings. Through November 2011, the program has provided 15,000 children and families with dental services and distributed 14,000 oral health kits; CF3 trainers have conducted 62 educational presentations, reaching more than 1,200 health care providers.<sup>31</sup>



In 2004, more than \$1.3 billion in health care costs in Colorado were attributable to smoking.

444,000

Smoking is responsible for an estimated 444,000 premature deaths in the United States each year

## Healthy Adolescents

### Tobacco Use: Still the Leading Preventable Cause of Death in the United States

Half a century after the U.S. Surgeon General first reported on the lethal implications of tobacco use, nearly 50 million Americans continue to smoke. While smoking rates have declined over the past several decades, smoking is still responsible for an estimated 444,000 premature deaths in the United States each year, including approximately 4,400 in Colorado.<sup>32</sup> About 88 million non-smoking Americans are exposed to harmful secondhand smoke, including more than half of children between the ages of 3 and 11 years.<sup>33</sup>

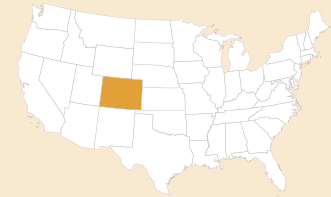
Cigarette smoking exacts a heavy toll on employers and the health care system. In Colorado, smoking-related productivity losses cost employers more than \$1 billion per year.<sup>34</sup> In 2004, more than \$1.3 billion in health care costs in Colorado were attributable to smoking.<sup>35</sup>

#### *Return on Investment*

A number of tobacco cessation programs have been shown to reduce costs. A 2008 analysis from the Substance Abuse and Mental Health Services Administration analyzed four school- or community-based tobacco prevention programs. It found that for every \$1 invested in the programs, between \$10 and \$59 were returned in cost savings across several categories: medical treatment, quality of life, lost wages and other costs.<sup>36</sup>

Smoking cessation is often considered the “gold standard” for cost-effective public health interventions.<sup>37</sup> While these programs are diverse, research shows they can have a positive ROI for both employers<sup>38</sup> and managed-care organizations.<sup>39</sup> A 2010 analysis by researchers at Pennsylvania State University found that every \$1 spent on tobacco cessation programs in Colorado saved between 82 cents and \$2.66.<sup>40</sup> A report sponsored by the Colorado Clinical Guidelines Collaborative (now HealthTeamWorks) found





## Colorado Spotlight

### *Colorado N-O-T Program*

N-O-T (Not On Tobacco), sponsored by the American Lung Association and funded by Amendment 35 dollars, is a voluntary tobacco cessation program for high school youth. During the course of the 10-week program, participating teens learn to identify reasons for smoking, alternatives to smoking and strategies for quitting. A review of N-O-T program evaluations from 1998-2003 found that N-O-T youth participants were twice as likely to quit smoking than young people in the comparison group.<sup>44</sup> N-O-T is recognized as an evidence-based model program by the Substance Abuse and Mental Health Services Administration and the U.S. Department of Justice's Office of Juvenile Justice and Delinquency Prevention. From 2009-10, nearly 1,300 youth across 25 counties participated in the N-O-T program in Colorado.<sup>45</sup>



that health plan expenditures for smoking cessation programs could be fully offset by health cost savings.<sup>41</sup> Investments in tobacco cessation, the report concluded, lead to improved health outcomes, lower health costs and reduced health insurance premiums for Coloradans.

Legislative policies, such as prohibiting smoking in public places or increasing tobacco taxes, also save money in the long term. The California Tobacco Control Program, a state-funded intervention founded in 1989 that targets adult smoking and social norm change, has resulted in sharply reduced cigarette smoking rates as well as lower per-capita health care expenditures.<sup>42</sup> A less ambitious program in Arizona, which targets teens and refrains from negative commentary on the tobacco industry, resulted in health care savings approximately 10 times the cost of the program from 1996-2004.<sup>43</sup>



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75%

of obese employees are more likely to experience high rates of absenteeism than healthy weight employees

## Healthy Adults

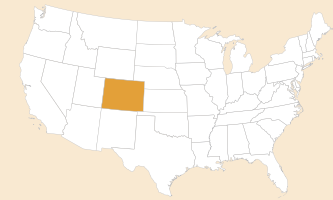
### Workplace Wellness: Toward a Healthier, More Productive Colorado Workforce

Colorado businesses, faced with high health care costs and a tough economy, find it increasingly important to help their employees become healthier and more productive. One study estimated that the costs due to lower productivity associated with employee health-related problems are more than twice those of medical and pharmacy costs.<sup>46</sup> Another found that obese employees are about 75 percent more likely to experience high rates of absenteeism than healthy weight employees.<sup>47</sup> In addition, many employers are concerned with the substantial cost of “presenteeism” — defined as lost productivity from employees who come to work with colds or other conditions that affect their productivity.<sup>48, 49, 50</sup> Workplace wellness programs also may increase office morale, with the related benefits of reducing voluntary attrition and turnover.<sup>51</sup>

Workplace wellness programs are becoming more widely accepted. Employer-sponsored health promotion programs can include benefits such as health risk assessments, tobacco cessation, nutrition education and gym memberships. Many literature reviews have concluded that workplace wellness programs can reduce absenteeism due to sickness<sup>52</sup> and improve firm profitability in the process.<sup>53</sup> While the evidence on presenteeism is limited, preliminary research indicates that health promotion programs can reduce on-the-job productivity losses caused by ill health.<sup>54</sup> The federal Affordable Care Act includes a number of provisions related to employee health, including establishing a five-year grant program to encourage workplace wellness programs in small businesses.

## Return on Investment

A 2010 study published in the journal *Health Affairs* tackled the question of whether workplace wellness programs resulted in cost savings.<sup>55</sup> After reviewing recent literature, the study found that for every dollar spent on wellness programs, overall medical costs fell by \$3.27. Absenteeism costs were reduced by \$2.73 for every dollar spent. While the study was careful to note that further exploration of the exact causes of cost savings is necessary, its findings underscore the potential for positive ROI from such programs.



## Colorado Spotlight

### *LiveWell Colorado's Workplace Wellness Leadership Group*

LiveWell Colorado has convened a multi-sector team of senior executives from around the state to advance efforts to promote healthy eating and physical activity in workplaces across Colorado. Through peer-to-peer conversations, the Colorado Worksite Wellness Leadership Group hopes to encourage CEOs to implement changes in their organization that make the healthy choice the easy choice. LiveWell Colorado will track organizations committed to making such changes. A key priority of the Leadership Group is to make healthy workplace resources available to all Colorado organizations — public and private, large and small, for-profit and not-for-profit — so that all Coloradans have the opportunity to become healthier and be more productive in the workplace.



In the United States, vaccines repeatedly have been shown to save billions of dollars per year.



# Healthy Aging

## Vaccines Are One of the World's Most Cost-effective Public Health Measures

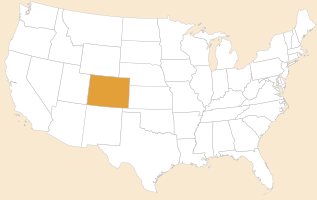
The World Health Organization estimates that vaccines save more than three million lives worldwide each year and prevent countless more illnesses and disabilities.<sup>56</sup> In the United States, vaccines repeatedly have been shown to save billions of dollars per year.<sup>57</sup>

For adults ages 65 and over, the Centers for Disease Control and Prevention recommends a one-time pneumococcal vaccine and an annual influenza vaccine. Although both vaccines have been proven safe and effective for this age group, the 2011 Colorado Health Report Card finds that fewer than 60 percent of Colorado's older adults have received both.

Despite the availability of a vaccine effective at preventing pneumonia, approximately 25,000 pneumococcal-related deaths occur annually among U.S. adults over the age of 50. The annual economic burden of the disease among these adults is estimated at \$3.7 billion in direct costs and \$1.8 billion in indirect costs.<sup>58</sup> In addition, more than 226,000 Americans are hospitalized for influenza and between 3,000 and 49,000 people die of the disease each year.<sup>59</sup> The vast majority of these deaths, up to 90 percent, occur in Americans over the age of 65.<sup>60</sup>

### *Return on Investment*

A 2009 literature review published in the journal *Vaccine* concluded that pneumococcal vaccines are effective in the prevention of pneumonia and, in some cases, result in cost savings.<sup>61</sup> Studies that examined older adults found that flu vaccines can reduce medical costs, especially when other benefits such as preventing suffering and incapacity are considered.<sup>62, 63</sup>



## Colorado Spotlight

### Centura Health

Centura Health, Colorado's largest nonprofit health care system, offers a flu vaccination program at its seven senior-living residences (independent living, assisted living and nursing home) along the Front Range. The program makes the vaccine available to Centura's 1,200 senior-living residents and their family members at designated clinics and takes the vaccine to individuals who have difficulty leaving their beds. Flu shots are promoted via resident newsletters, flyers and word of mouth from staff.<sup>64</sup> Centura boasts a vaccination rate for long-term care residents that is at or above the state average (88 percent) and equal to or better than the national average (92 percent). At two Colorado Springs facilities, Medalion Retirement Community and the Centura Health Namaste Alzheimer Center, flu vaccination rates are between 98 and 99 percent.<sup>65</sup>

## Conclusion

Research shows that prevention can reduce health care costs and improve health. Nurse visits, vaccinations, smoking cessation efforts and worksite wellness programs are already providing high-quality, health-related services while lowering the amount of money spent on health care.

In a society that's become accustomed to immediate gratification, it's important to note that some public health initiatives, while effective, don't always demonstrate an *immediate* return on investment. The research behind the initiatives profiled in this supplement show that prevention efforts work over time and can drive compounded benefits. The Nurse-Family Partnership, for example, helps pregnant women (a 20 percent reduction in smoking), their babies (decreased pre-term and low birth-weight rates) and their families (fewer instances of domestic violence). Vaccinations help our children grow up healthy and make our communities as a whole healthier, while saving millions of lives across the globe. One has only to look at countries where vaccines are scarce to understand the value of prevention — something many industrialized countries take for granted.

The programs profiled in this supplement to the 2011 Colorado Health Report Card provide a sampling of preventive measures with evidence attesting to their effectiveness. Policymakers and health care leaders should come to understand the cost saving potential of these and other evidence-based programs as they make the hard decisions necessary to address the state's budget woes while improving the health of all Coloradans. As this supplement demonstrates, the potential benefits of prevention are an investment we can ill afford not to make.



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