The Value of Primordial and Primary Prevention for Cardiovascular Disease

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***Circulation*. July 25, 2011;124:000-000**

A Policy Statement from the American Heart Association

Cardiovascular diseases (CVD), including heart disease and stroke, are the leading cause of death and disability in the U.S. Unfortunately, the disease process can start early in life and is influenced over time by lifestyle behaviors, the environments where people live, and modifiable risk factors, including smoking, obesity and being overweight, physical inactivity, high blood pressure, elevated blood cholesterol, and Type 2 diabetes. In many instances, CVD can be prevented or delayed if individuals modify their risk factors for the disease.

Policy makers ask however, if efforts aimed at prevention provide value, that is are such interventions worth what we pay for them? This paper by the American Heart Association summarizes the cost-effectiveness and value of primary and primordial prevention and makes the important case for the valuable impact of policy and environment change and early clinical intervention on public health, national security, and our nation's workforce productivity. Primordial prevention is defined as prevention of the development of risk factors before they happen and primary prevention is defined as interventions designed to modify adverse levels of risk factors once they are present with the goal of preventing an initial CVD event. The ultimate goal is to increase the number of years that people can enjoy quality of life and compress the time that people experience disease and disability.

Major takeaways:

- Policy change makes the greatest impact when it optimizes the environments where people live, learn, work and play -- workplaces, schools, homes, and communities, making healthier behaviors and healthier choices the norm by default or by design, putting individual behavior in the context of multiple-level influences. Research continues to demonstrate that environment and policy change is one of the most impactful ways to improve public health, providing the counterargument to those policy makers who argue that government has no role, that health is determined by individual responsibility.

- Although there may not be significant cost savings in the short-term to society (or even long-term to the Federal government), there is value in making an important investment in the health of our nation.

- The medical and research communities are challenged to further clarify the effectiveness and sustainability of cost-effective preventive cardiovascular services so that proven interventions can be provided in home-, work-, school- and community-based settings to save lives, money, and resources.

- Legislators, public health and planning professionals and community representatives can help to facilitate this objective by supporting selected advocacy initiatives and empowering localities to embrace a culture of lifestyle that incorporates physical activity, healthy nutrition options, smoking bans, and affordable access to health care for all Americans.

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Summary of Cost Savings or Value for Key Primordial and Primary Prevention Strategies in the U.S.

Intervention	Primordial or Primary Prevention	Cost Savings/Value	Source
Comprehensive Prevention Programs			
Community-based programs to increase physical activity, improve nutrition and prevent smoking and other tobacco use	Primordial	A return on investment of $5.60 for every dollar spent within five years	1
Comprehensive Worksite Wellness Programs	Primordial and Primary	Within first 12 to 18 months, medical costs fall by approximately $3.27 for every dollar spent on worksite wellness; absenteeism costs fall by about $2.73 for every dollar spent	2
Comprehensive School-based initiatives to promote healthy eating and physical activity	Primordial	Cost effectiveness is $900-$4305 per quality adjusted life year (QALY) saved.	3,4
Physical Activity			
Building bike and pedestrian trails	Primordial and Primary	For every $1 invested in building these trails, nearly $3 in medical cost savings	5
Physical activity interventions such as pedometer and walking programs.	Primordial and primary	Incremental cost effectiveness ratios (ICERs) ranging from $14,000-$69,000 per QALY gained relative to no intervention, especially in high-risk groups.	6-8
Diet/Nutrition			
Reducing sodium in the food supply	Primordial and Primary	It is estimated that reducing population sodium intake to 1500 mg/day would result in $26.2 billion in health care savings annually.	9
Obesity Prevention			
Obesity Management Program	Primary	One-year interventions have shown reduction in risk categories such as poor eating and poor physical activity habits as well as in weight for a return on investment of $1.17 for every dollar spent.	10
Tobacco Control and Prevention			
Excise Taxes	Primary	A 40% tax-induced cigarette price increase would reduce smoking prevalence to 15.2% by 2025 with large gains in cumulative life years (7 million) and QALYs (13 million) for a total cost-savings of $682 billion.	11

Comprehensive Smoke-Free Air Laws in Public Buildings	Primordial	Eliminating exposure to second-hand smoke would save an estimated $10 billion annually in direct and indirect health care costs.	12
Tobacco cessation programs	Primary	ICERs for treatment programs range from a few hundred to a few thousand dollars per QALY saved.	13
Comprehensive Coverage for Tobacco Cessation Programs in Medicaid Programs	Primary	Comprehensive coverage led to reduced hospitalizations for heart attacks and a net savings of $10.5 million or a $3.07 return on investment for every dollar spent. States offering comprehensive smoking cessation therapy to their employees or in their tobacco control and prevention programs save $1.10-$1.40 in healthcare expenditures and productivity for every dollar spent.	14,15
Tobacco cessation programs for pregnant women	Primary for mother; Primordial for fetus	Produce a cost benefit ratio as high as 3:1, (i.e. for every dollar invested in cessation/relapse programs, 3 dollars are saved in downstream health-related costs).	16
Diabetes Prevention			
Diabetes Screening	Primordial	Targeted screening for type 2 diabetes based on age and risk was found to be far more cost-effective (ICERs ranging from $46,800-$70,500 per QALY gained) when compared with universal screening (ICERs from $70,100-$982,000 per QALY gained). Targeted screening for undiagnosed type 2 diabetes in African Americans between 45 and 54 years old was found to be the most cost-effective with an ICER of $19,600 per QALY gained relative to no screening.	17,18
Lifestyle changes in diabetes prevention	Primary	Lifestyle changes reduced the incidence of diabetes by 58%; whereas, metformin therapy reduced risk by 31%. In patients with impaired glucose tolerance primary prevention in the form of intensive lifestyle modification has median ICERs of $1,500 per QALY gained.	19, 20
Polypill Administration	Primary	Polypill medication treatment in men was less expensive and more effective, with an average cost of $70,000 compared with $93,000 for no treatment, and resulted in 13.62 QALYs when compared with 12.96 QALYs without treatment.	21

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