
Nutritional Supplements for Health Promotion and Disease Prevention: A Policy Perspective

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Health care costs in the United States in 1999 amounted to *1.2 trillion dollars*. This is 13 percent of the U.S. Gross Domestic Product. (Health United States 2001) As policy makers seek ways to ameliorate this stress on the economy, they should consider the potential benefits of rational supplement use as well as general dietary improvements. The appropriate use of nutritional supplements could reduce the incidence of disease and thereby also reduce escalating health care costs.

In a review of nutrition initiatives directed toward disease prevention, Dr. Michael McGinnis of the Robert Wood Johnson Foundation and Dr. Nancy Ernst of the National Institutes of Health quote from the 1988 Surgeon General's Report on Nutrition and Health: "For the two out of three adult Americans who do not smoke and do not drink excessively, **one personal choice seems to influence long-term health prospects more than any other: what we eat.**" (McGinnis 2001, emphasis added)

While the perceived leading causes of death in the United States are generally identified as heart disease and cancer, the leading *real causes of death* are cigarette smoking, poor nutritional habits, and lack of exercise. "Studies have variously associated dietary factors or sedentary lifestyles with between one-fifth and one-third of cardiovascular deaths, 20-60% of fatal cancers, and 50-80% of diabetes mellitus cases, including 30% of diabetes deaths." (McGinnis 2001)

"As new understanding is gained about the relationship between dietary patterns and disease outcomes, the role of nutrition is likely to grow as a public policy priority." Every year, Americans suffer a heavy burden of disease that is potentially preventable, including 14 million cases of heart disease, 1.2 million cases of preventable cancer, more than half a million strokes, 16 million cases of diabetes, 28 million cases of chronic lung disease, over 285,000 low birth weight babies, and 2500 babies with neural tube defects. It has been predicted that healthier dietary practices could save \$71 billion per year in medical costs, lost productivity, and the value of lives lost prematurely to heart disease, cancer, stroke, and diabetes. This estimate *does not include* the costs associated with other conditions linked to nutritional habits, including osteoporosis, hypertension, overweight, and neural tube birth defects. (McGinnis 2001)

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Even small changes could have a major impact on disease and on the medical costs of treating disease. Dr. Jeffrey Blumberg of the School of Nutrition Science and Policy at Tufts University has estimated: “A 5-yr delay in the onset of cardiovascular disease could save about \$69 billion annually. A delay in the onset of strokes by 5 yr would be associated with annual savings of \$15 billion. A 5-yr delay in the occurrence of hip fracture annually could cut the number of events by 140,000 each year and save an estimated \$5 billion annually.” *Altogether, the estimated savings that could result from delaying the onset of heart disease, stroke and osteoporosis by five years through improved nutrition would total \$89 billion per year.* (Blumberg 1997)

“Food habits develop early in life, and this is a useful time to adopt preventive nutrition behaviors, although an emphasis on older adults appears more critical at this juncture, since by 2004 the cost of health care for those over 65 is projected to constitute 50% of the total national health care bill. Together with an increase in physical activity and the cessation of tobacco use, dietary modification and improvements in nutritional status present us with the greatest potential for reducing the incidence of chronic disease, improving public health, and limiting the growth of health care expenditures.” (Blumberg 1997)

Numerous investigators have attempted to quantify the potential for specific nutritional supplements to prevent suffering and mortality from nutrition-related conditions as well as to reduce health care costs:

- If all women of childbearing age used multivitamins with folic acid, it should be possible to reduce the current incidence of neural tube birth defects by 50 percent or more. (MMWR 1992) In 1992, there were 4600 babies born with neural tube defects, representing hospital costs of \$141 million. The estimated lifetime cost of caring for a person with spina bifida is \$258,000. (Bendich 1997)
- If pregnant women used a multivitamin containing zinc, it should be possible to reduce substantially the number of babies born with low birth weight (LBW). Currently about 280,000 LBW babies are born each year. The average hospital charge for LBW is \$86,000, for an annual cost of \$2.6 billion for 1995. About half of that cost (\$1.3 billion) was paid by Medicaid. (Bendich 1997)
- Dr. Robert P. Heaney of Creighton University, an internationally recognized expert on calcium and bone health, estimated in 1993 that supplementation with calcium and vitamin D could reduce the rate of hip fracture by at least 20 percent, meaning 40,000 to 50,000 fewer hip fractures every year in the United States and an average annual savings of \$1.5 to \$2 billion. (Heaney 1993) A more recent analysis, based on new evidence regarding the potential benefit, concluded that more than 130,000 hip fractures annually could be avoided if people over the age of 50 habitually consumed about 1200 milligrams per day of supplemental calcium. The savings in direct health care cost was calculated to be \$2.6 billion. (Bendich 1999)

- The routine use of multivitamin and mineral supplements by the elderly could improve immune function and thus reduce infectious disease, potentially cutting the number of sick days by half. (Chandra 1992)
- “The annual cost of lens extractions is almost \$5 billion, but if the rate of cataract development could be delayed 10 yr, 50% of these operations could be avoided and \$2.5 billion could be saved annually.” (Blumberg 1997)
- Long-term vitamin E supplementation has the potential to reduce the incidence of and mortality from heart disease, currently the leading cause of death in the United States. Over 2 million patients are hospitalized each year with coronary heart disease, entailing hospital charges of almost \$52 billion. Studies suggest that up to \$8.4 billion could be saved if people took at least 100 IU per day of vitamin E regularly. A study in England indicates that regular use of 400 IU of vitamin E could potentially reduce the risk of nonfatal myocardial infarction (MI) by 77 percent. If this reduction could be realized, almost 500,000 hospitalizations for nonfatal MI could be avoided each year, for a cost savings up to \$14 billion. (Bendich 1997)
- Researchers estimated in 1995 that multivitamins containing folic acid could optimize intake of this B vitamin and help avoid as many as 56,000 deaths per year due to heart disease. (Boushey 1995) More recently, another model predicted that *fortification with folic acid* would reduce heart attacks (myocardial infarctions) by 13 percent in men and by 8 percent in women over a 10-year period, with similar reductions in mortality from coronary heart disease. In addition, the model predicted that if all patients with heart disease were *supplemented* with 1 mg of folic acid and 0.5 mg of vitamin B-12, an additional 310,000 deaths from heart disease could be avoided over a 10-year period. (Tice 2001)

The use of vitamin and mineral supplements could offer diverse improvements in basic nutrition, as well as protection against neural tube birth defects and cardiovascular disease. A modest multivitamin with minerals could virtually eliminate the risk of micronutrient deficiency in the poor of this nation. It could provide substantial assurance against anemia in children and in women of child-bearing age and could substantially improve immune function in the elderly.

Dr. Alexander Leaf of Harvard Medical School and Massachusetts General Hospital has emphasized that treating heart disease *after* it occurs is expensive and is palliative, not curative. He argues that “logic clearly requires that more effort be directed at preventing the disease.” Current dietary approaches to prevention focus on decreasing serum cholesterol levels, but other interventions that have no effect on blood lipids may be even more important. For example, taking one aspirin every other day lowered heart disease by 45 percent in physicians; antioxidant nutrients may prevent the oxidation of low density lipoprotein cholesterol (LDL) and therefore prevent damage to the arterial wall; and omega-3 fatty acids in marine oils have a number of effects that help prevent heart

disease. Leaf notes that all of these substances “exert their beneficial effects at the level of the artery wall, where atherosclerosis occurs.” Omega-3 fatty acids may also help prevent fatal cardiac arrhythmias. (Leaf 1992) Both antioxidants and omega-3 fatty acids are easily and inexpensively available in nutritional supplements.

Nutritional immunologist Dr. Ranjit Chandra has said: “The era of nutrient supplements to promote health and reduce illness is here to stay. In selected groups such as the elderly, there is overwhelming evidence of immunologic enhancement following such an intervention. Some data suggest that a reduction in the incidence and duration of infection may also occur. In North America, a year’s supply of micronutrient supplementation costs less than 3 visits to a physician and much less than hospitalization for 1 day. Thus, these preliminary data suggest that a micronutrient supplement may be a cost-effective preventive intervention in old age.” (Chandra 1997)

Bottom Line

The potential role of nutritional supplements in protecting health should be recognized by public and private organizations that advise consumers about food and supplement choices in the context of healthy lifestyles. The potential benefits and health care cost savings of improved nutrition, as illustrated in this report, are substantial, and more effort should be put into fostering behavior change, including regular supplement use.

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