

# Executive Summary

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Nutrient shortfalls have health consequences that could impact daily life and overall wellbeing. National nutrition surveys show shortfalls in intakes of many nutrients. About one-third of American adults fail to get their average daily requirement for vitamin C, even though vitamin C is relatively easy to obtain from foods; low intakes can lead to poor energy levels and weakness. More than 90 percent of adults fail to get their average daily requirement of vitamin E, and many fall short in other vitamins and minerals, which can impact immune function. More than two-thirds of women of childbearing age have low intakes of iron, which can impair cognitive function, physical capability, and endurance.

Even the most conscientious consumers find it difficult to get all the nutrients they need from food alone. While dietary improvement is a desirable goal, changing dietary patterns is extremely difficult. On the assumption that it is better for people to obtain recommended amounts of vitamins and minerals than to limp along with low intakes, a multivitamin with minerals which can be purchased for less than a dime a day is an inexpensive and effective way to fill a number of known nutrient gaps.

Nutrition experts at the Harvard School of Public Health have created an online version of a food pyramid with a notation recommending a “daily multivitamin plus extra vitamin D (for most people).” Recognizing the special nutritional needs of senior citizens, researchers at Tufts University designed a food guide pyramid for the elderly, which features a flag at the top as a reminder that supplements of calcium, vitamin D, and vitamin B-12 may be needed for optimal health. The American Academy of Nutrition and Dietetics (formerly the American Dietetic Association) has a policy statement

emphasizing the importance of good food choices but also recognizing that supplements can help some people meet their nutritional needs.

Dietary supplements are used by the majority of adults in the United States. More women than men use them; use also increases with age and education. Health professionals are just as likely as members of the general public to use supplements regularly. Supplement use should be seen as one component of the search for a healthier lifestyle, including improvements in overall food habits and engaging in physical exercise. While much of the current research on nutrition and health focuses on the prevention of chronic disease, the primary reason most people use multivitamins and other nutritional supplements is to support overall wellness.



A generous intake of calcium plus vitamin D demonstrably helps build optimum bone mass during childhood and adolescence and also slows the rate of bone loss that naturally occurs with aging. National surveys show that U.S. calcium and vitamin D intakes are below recommended levels, especially for women—despite the fact that substantial research has shown supplements of calcium and vitamin D to be effective in maintaining or increasing bone density, and potentially in protecting health in other ways as well.

Nutritional supplements are similarly helpful in addressing a woman's increased nutrient needs during pregnancy. Prenatal multivitamins with minerals are commonly prescribed to ensure that both the baby's and the mother's needs are met. In addition to meeting normal nutritional needs during pregnancy, a multivitamin can also play a critical role in protecting against some birth defects. An abundance of data shows that women who get 400 mcg of supplemental folic acid per day for one to three months prior to conception and one to three months after conception can substantially lower the risk of having a baby with a neural tube defect such as spina bifida. In most studies demonstrating these results, the protective amount of folic acid was consumed in the form of a multivitamin supplement.

While adequate nutrient intake is critical for all age groups, it may have particular significance for the elderly. Antioxidant supplements have been shown to have a positive impact on eye health and cognitive function. Adequate nutritional status also affects the condition of the skin and supports lung and muscle function. Calcium and vitamin D supplements, as previously noted, can have a powerful impact on bone health, and the Surgeon General says it is never



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too late to benefit from improved intakes of these nutrients. Vitamin D may also reduce the incidence of falls in older people. Vitamin and mineral supplements have been shown in some studies to improve immune function in the elderly. Low zinc intakes are associated with an increased risk of infections, including pneumonia. Supplemental intakes of vitamin E have had a positive effect in decreasing upper respiratory infections in some studies. For these reasons, it makes sense to encourage the elderly to use multivitamin and mineral supplements. Some experts have also advocated providing a basic multivitamin and mineral supplement to the elderly in nursing homes, as a matter of policy, to avoid risking the consequences of inadequate intakes.

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### **...a healthy lifestyle must include a focus on dietary improvement...**

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Traditional models of health and nutrition were focused on dietary improvement and nutritional adequacy. Good dietary patterns and adequate nutrient intakes based on the Recommended Dietary Allowances were considered the best guides to health, but chronic disease prevention through dietary modification was not a common topic of discussion. This focus changed dramatically in the 1980s following the publication of numerous reports suggesting a direct relationship between dietary factors and the incidence of numerous “killer diseases.” The reports asserted that improved dietary patterns, including increased intakes of fruits, vegetables, and whole grains, could reduce the risk of chronic disease. They also discussed which components of these foods were likely to be most protective, including fiber and a number of antioxidant nutrients. The reports emphasized the importance of improved food habits and downplayed the importance of increasing

the intake of specific nutrients, but at the same time numerous clinical trials were undertaken specifically to evaluate the possibility that supplementation with some of the individual nutrients (especially antioxidants) might reduce the risk of cancer and heart disease.

While countless epidemiological trials support the hypothesis that dietary improvement can reduce the risk of chronic disease, the design of clinical trials to test that hypothesis is a challenge. Nevertheless, many clinical trials have in fact demonstrated benefits against disease for specific nutrients—for example, calcium to protect against osteoporosis, folic acid to help prevent some birth defects, and omega-3 fatty acids to reduce the risk of heart disease. On the other hand, clinical trials of beta-carotene for cancer prevention, vitamin E for lowering heart disease risk, B vitamins for protecting against cardiovascular disease, and selenium and vitamin E for prevention of prostate cancer so far have largely failed to confirm the benefits suggested by earlier studies.

There is vigorous debate regarding the appropriate design of clinical trials to test the hypothesis that specific nutrients or combinations of nutrients may help protect against chronic disease. Most trials are done with one or a few nutrients, even though vitamins and minerals generally work as a team in normal metabolism and never operate alone. Clinical trials are often undertaken in people who have already suffered the disease of interest—for example, in people who have recently suffered a stroke or heart attack. Testing the effects of vitamin or mineral supplements in such populations cannot be considered a true test of the prevention hypothesis.

Should the disappointing results of many of these clinical trials lead to a reconsideration of the appropriate study design for evaluating the preventive effects of nutritional interventions? Many experts believe a robust reconsideration is necessary.

The bottom line is that a healthy lifestyle must include a focus on dietary improvement. Generous intakes of the essential nutrients will support the normal functioning of the body and enhance health in a myriad of ways. The rational use of nutritional supplements, combined with a healthy diet, will contribute substantially to health promotion and disease prevention.



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