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In the last two decades, vitamin C deficiencies in the U.S. have steadily declined, in part because of increased use of dietary supplements. Unfortunately, some population groups still experience high rates of deficiency.

TOTAL VITAMIN C DEFICIENCIES DECLINING, BUT STILL A PROBLEM FOR SOME GROUPS

The National Health and Nutrition Examination Survey (NHANES) is a continuous annual survey conducted in the United States by the National Center for Health Statistics (a division of the CDC). A recent study used data from two separate NHANES surveys – one from 2003-2004 and another from 1988-1994 – to examine whether or not vitamin C deficiencies have increased or decreased over time.

Using serum vitamin C concentration data collected from 7200 individuals (age 6+) in 2003-2004 and 20,600 individuals (age 6+) in 1988-1994, researchers marked individuals as “deficient” or “not deficient”, where deficiency was classified as serum concentration $<11.4 \mu\text{mol/L}$. (At this level, clinical features of manifest scurvy may be seen.) Additional analyses examined possible correlations between vitamin C deficiency and a number of factors, including sex, age, race-ethnicity, smoking status, adiposity, socioeconomic status, vitamin C supplement use, and dietary intake.

Encouragingly, vitamin C deficiencies declined across most subgroups, and in many groups the declines were substantial. At least part of this improvement is due to vitamin C supplementation. “In prosperous societies, supplement consumption has a significant effect on body stores and circulating concentrations of vitamin C,” the authors reported. “In NHANES 1999–2000, 52% of adults reported consumption of supplements in the past month...these recent data show increased usage since the overall 40% usage reported during NHANES III [1988-1994] and are likely to explain in part the improved vitamin C status of the U.S. population.”

Unfortunately, certain population groups remain at risk of vitamin C deficiency. Smokers are the highest risk subgroup, with 18% of male smokers and 15.3% of female smokers being vitamin C deficient (compared to 5.3% and 4.2% for male and female non-smokers, respectively). Smoking accelerates vitamin C turnover and lowers serum concentrations, which in turn increases the likelihood of deficiency. Lower income groups were also at higher risk for deficiency, and men were more likely to be deficient than women. Children, teens, and adults over the age of 60 were less likely to be deficient than adults between the ages of 20 and 60.

The study concludes by stating: “...the vitamin C status of the US population appears to have substantially improved from 1988–1994 to 2003–2004. Nevertheless, the prevalence of vitamin C deficiency in various subgroups remains a concern.”

< Schleicher RL, Carroll MD, Ford ES, Lacher DA. Serum vitamin C and the prevalence of vitamin C deficiency in the United States: 2003–2004 National Health and Nutrition Examination Survey (NHANES). Nov 2009. Am J Clin Nutr 90:1252-1263. >