

# Smoke and poor diet cause low vitamin C levels in India's elderly population

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Up to three quarters of elderly people in parts of India have vitamin C deficiency, a study by the London School of Hygiene & Tropical Medicine found. Vitamin C is an essential nutrient for human health, playing a role from maintenance and repair of tissues to antioxidant activities. This study is the first ever large screening of vitamin C blood levels in the older Indian population.

Vitamin C deficiency is primarily due to a diet which is low in fruit and vegetables. Vitamin C blood levels can also be depleted by [smoking](#) or chewing tobacco and cooking with fuels such as wood crops or dung (used by 70% of the rural population). One of the effects of tobacco and inhaling fumes from home or cooking fires is oxidative stress (which can cause damage to cells) and the body uses vitamin C to combat this.

The study, coordinated by Professor Astrid Fletcher of the London School of Hygiene & Tropical Medicine in collaboration with Aravind Eye Hospital Pondicherry and the All [India](#) Institute for Medical Sciences in Delhi, has been published in *PloS One*.

The research, funded by the Wellcome Trust, highlights marked differences between the study locations in the north and south of the country, although in both regions the percentages of vitamin C deficient people over 60 years of age were extremely high, with 74% in the north and 46% in the south. Only 11% and 26% respectively, met the criteria for adequate levels. Vitamin C levels were also found to vary seasonally, in conjunction with the monsoon months, thought to reflect the lower

intake of fruit and vegetables.

The large population-based study involved over 5000 people aged 60 years or over from rural villages and small towns and included interviews about their diet, blood analysis and malnutrition assessments.

Dr Ravindran, principal author of the study said " while much attention has focused on increasing levels of obesity in India, the problem of poor nutrition in the older population has received much less attention even though India has one of the fastest growing older populations. In poor communities, such as in our study, consideration needs to be given to measures to improve the consumption of vitamin C rich foods, and to discourage the use of tobacco and biomass fuels".

Provided by London School of Hygiene & Tropical Medicine

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