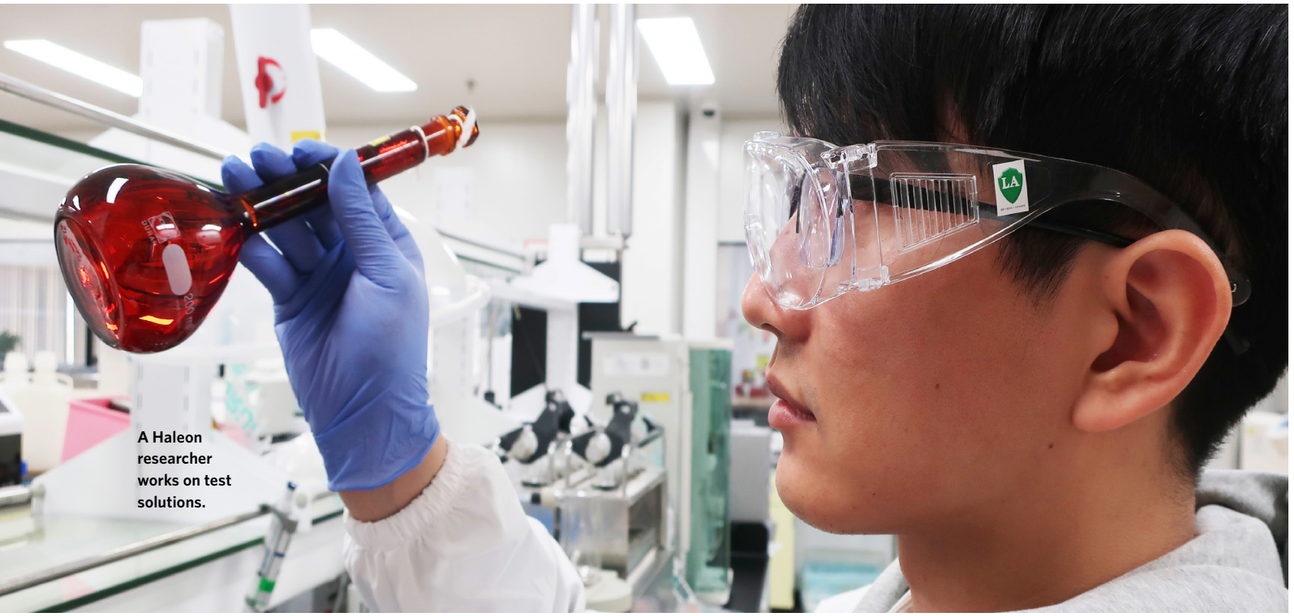

A Haleon researcher works on test solutions.

WEIGHING UP THE EVIDENCE FOR MULTIVITAMINS

A large-scale study in China, spanning more than three decades, HAS EXPLORED THE EFFECT OF MULTIVITAMINS to treat dietary deficiencies.

A huge number of people take multivitamins or mineral supplements every day — including 50% of all American adults, and 70% of those aged over 65. However, there continues to be debate on the potential health benefits of such supplements.

Youlin Qiao is a professor of epidemiology at the Chinese National Cancer Center's Department of Cancer Epidemiology in Beijing, as well as a researcher at Peking Union Medical College, and a fellow of the Chinese Academy of Medical Sciences.

He has been studying cancer and nutrition for more than three decades, and as a principal investigator for the China Linxian Study — a major joint trial with the US National Cancer Institute (NCI) — he shares his insights on the use of multivitamins to combat dietary deficiencies.

YOULIN QIAO
Professor of epidemiology at the Chinese National Cancer Center's Department of Cancer Epidemiology

What is the background of the study?
China carried out a national survey of causes of death in 1973 to 1975 to inform public health policies. Linxian county, a rural area in Henan Province, showed the highest mortality rate from oesophageal squamous cell carcinoma (ESCC) — 10 times higher than average across China, and 100 times higher than the rate in people of European descent in the United States. ESCC accounts for 90% of oesophageal cancer cases, more than half of which occur in China.

One assumption for the high incidence rate of oesophageal cancer in Linxian at that time was that diets were low in fresh fruits and vegetables. We found that people in the area had low levels of various vitamins and minerals.

In 1978, China started collaborative cancer epidemiology research with the United States. To learn more about oesophageal cancer and the influence of nutritional deficiencies on diseases and mortality in Linxian, we teamed up with scientists from the NCI in 1982, to conduct China's first large-scale, long-term follow-up nutritional intervention study.

What did you do in the study?
We conducted two randomized, double-blind and placebo-controlled trials. We provided a general population of 29,584 residents aged 40–69 with daily supplements of micronutrients or a placebo. This continued from 1986 to 1991, and then we followed up for the next 25 years to investigate the incidence of various diseases.

A LEADING COMPANY FOR NUTRITIONAL RESEARCH

Haleon is a global leader in providing consumer health solutions, committed to advancing evidence-based nutritional science.

- With strong research capabilities, Haleon has established relationships with more than three million healthcare professionals globally, and has been working with research institutions for the past **40** years to conduct clinical trials to investigate the benefits of vitamins.
- In the past six years, the company has been involved in **82** large-scale clinical trials, resulting in **331** publications. Among them, there are China's first large-scale nutritional intervention trial in Linxian to study the effect of multivitamin supplementation on oesophageal dysplasia[1,2]; and the COSMOS-Mind Study[3], which investigated the intake of multivitamins on cognitive function, and was published in *Alzheimer's & Dementia* in 2022.
- Based on the evidence from the studies and continuous nutritional research, Haleon is developing products to meet consumer needs in different areas of the world. As one of its three R&D centres globally, Haleon Suzhou Technical Center of Excellence in China has advanced equipment and a team focusing on formulation research and development.
- Haleon is developing multivitamin tablets, granules, soft gels, jelly drops and liquid drops to meet various consumer needs. The company is also planning to set up a personalized nutritional innovation platform in China to develop tailored nutritional solutions for Chinese consumers in the near future.
- In addition to vitamins, minerals and supplements (VMS), Haleon's internal team of **1,400** scientists is also developing products for oral health, pain relief, respiratory health and digestive health.

To a further 3,318 Linxian residents aged 40–69 who were diagnosed with premalignant lesions of ESCC, we gave daily multivitamin supplementation, or a placebo, for six years from 1985 to 1991, and then followed up for the next 29 years.

For those 3,318 participants, each one was provided three pills daily, including one beta carotene capsule and two multivitamin tablets* or placebos. They underwent monthly health checks and a doctor kept a record of how their dysplasia developed.

What did you hope to learn?
We wanted to evaluate the effect of multivitamin supplements on the progression of oesophageal dysplasia, and whether intake affected mortality rates. We also wanted to evaluate the effects of the supplements on total mortality and disease-specific mortality. The results were first published in *Journal of the National Cancer Institute*[1] in 1993.

We also conducted subgroup analysis in men under 55 to see if nutritional intervention at a younger age would have a different effect.

After six years of intervention, we decided on a longer follow-up to study the long-term impacts of multivitamin supplementation on cancer and other conditions — such as heart disease and cerebrovascular disease — among individuals with oesophageal dysplasia. After nearly 35 years, the results were published in the journal *Cancer*[2] in 2022.

There has been mixed evidence about multivitamin benefits. Why are studies on the value of multivitamins important?
In many developed countries, you may not notice chronic disease-related benefits of multivitamins, because there is generally little lack of nutrition. But, in many developing countries, there is still a need for intervention for people who suffer from nutritional deficiencies. So it's important that we continue to study the effects and benefits of multivitamins, informing public health policies.

The Linxian Study has become one of the milestones of vitamin and mineral research in China and around the world. The results from the 35-year follow-up provide valuable and informative data to assess the long-term safety and effectiveness of multivitamin intake. ■

** The multivitamin tablets were provided by Centrum, a brand of multivitamins produced by Haleon.*

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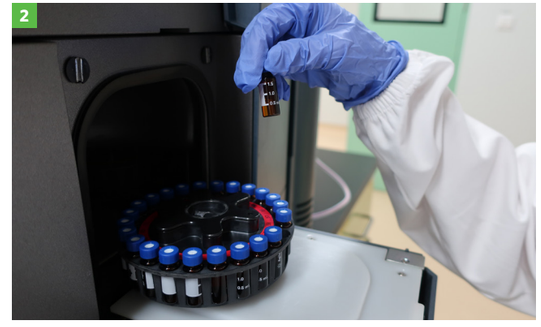

▲ **1. Haleon Suzhou Technical Center in Suzhou, China is one of the company's three R&D centres.**
2. High-performance liquid chromatography is used to detect vitamin components of Haleon products.