Helicobacter pylori (H. pylori) is present in all countries the world over. More than 50% of the world’s population harbour H. pylori in their upper gastrointestinal tract. It can negatively influence nutrition by affecting the uptake of iron and zinc and by increasing susceptibility to diarrhoeal disease. Beyond that, H. pylori is also a major cause of stomach diseases like chronic gastritis, and elevates the risk of developing stomach cancer.

The carbon-13 urea breath test is a quick and non-invasive diagnostic test to detect the presence of H. pylori. The patient drinks urea labelled with stable carbon isotopes (13C) that is dissolved in orange juice or citric acid to make sure it coats the entire surface of the stomach, thereby improving the test’s accuracy. If H. pylori is present, it metabolizes the urea and, after 30 minutes, produces carbon dioxide labelled with the stable carbon isotope (13CO2), which can be detected in the breath analysis (Fig. 8).

The IAEA has been undertaking research into H. pylori and its consequences for nutrition since 1999, and over the last 15 years, has worked with 25 low- and middle-income Member States to utilize and implement the carbon-13 urea breath test.

The IAEA is also continuing its research into the effect of H. pylori infection on gastric acid secretion and on iron and zinc absorption in asymptomatic individuals from developing countries. Gastric acid is essential for the conversion and absorption of micronutrients such as iron and zinc. The IAEA is also testing a new non-invasive way to measure gastric acid secretion using stable isotopes.

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