Executive summary

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The International Agency for Research on Cancer of the World Health Organization (IARC/WHO) convened a Working Group Meeting in February 2025 to provide guidance on the implementation of population-based *Helicobacter pylori* screen-and-treat strategies for adult populations to prevent gastric cancer.

The Working Group members included 35 experts from 20 countries and territories. There were two ad hoc contributors and one observer from the European Commission Joint Research Centre.

At a previous IARC Working Group Meeting, held in December 2013, in which *H. pylori* eradication was evaluated as a strategy for preventing gastric cancer [1], the Working Group recommended that countries explore the possibility of introducing population-based *H. pylori* screen-and-treat programmes. The Working Group emphasized the importance of conducting scientifically valid assessments of programme processes, feasibility, effectiveness, and possible adverse consequences when implementing such programmes [1].

However, practical guidance on implementation of such programmes at the population level has been lacking, which may have contributed to the relatively slow progress with piloting these strategies for gastric cancer prevention globally.

The 2025 Working Group Meeting and Working Group Report focused on providing detailed guidance for the implementation of population-based *H. pylori* screen-and-treat strategies for gastric cancer prevention, highlighting key aspects to consider and incorporate when implementing these programmes at the population level.

The global epidemiology of gastric cancer and *H. pylori*: current and future perspectives for prevention

Gastric cancer is a disease with high morbidity and poor prognosis although it is preventable. Most gastric cancer cases are attributable to chronic infection with *H. pylori*, and this burden is higher than that of any other cancer-causing infection, including human papillomavirus (HPV) and hepatitis B virus and hepatitis C virus combined. Although there exist concerted efforts globally for the elimination of cervical cancer and of viral hepatitis, there is a lack of interest and investment in gastric cancer prevention, except for a few countries with a high burden. The Working Group emphasized that, despite the decreasing trends in incidence and mortality rates observed in many countries, gastric cancer will remain a major global public health problem because of a substantial demographic-driven increase in new cases and deaths. Notably, the largest relative increases in the absolute numbers of new cases of gastric cancer and deaths from gastric cancer are predicted for countries with low and medium levels of the Human Development Index. These increases highlight the importance of coordinated global action for prevention efforts to reduce suffering and death from gastric cancer.

Current evidence from randomized controlled trials of the benefits and harms of population-based *H. pylori* screen-and-treat strategies for gastric cancer prevention and review of the existing recommendations, consensus reports, and guidelines

Existing guidelines, which focus on clinical management of *H. pylori* as a chronic infection, have generally become more assertive over time in their recommendations for population-based *H. pylori* screen-and-treat programmes for gastric cancer prevention. In a systematic review of randomized controlled trials of population-based *H. pylori* screen-and-treat strategies, in healthy *H. pylori*-positive individuals *H. pylori* eradication was associated with a 36% reduction in risk of developing gastric cancer, and in *H. pylori*-positive patients with gastric neoplasia undergoing endoscopic resection *H. pylori* eradication was associated with a 48% reduction in risk of recurrent gastric cancer. The available evidence from clinical trials also indicates that *H. pylori* eradication reduces the incidence of dyspepsia and reduces health-care costs. In addition, *H. pylori* eradication therapy does not appear to

increase the risk of oesophageal cancer or reflux symptoms. The Working Group acknowledged that the evidence related to benefits and potential harms comes mostly from high-risk countries and that information is limited for low-risk areas.

Examples of gastric cancer prevention efforts by WHO region

The Working Group described ongoing and planned gastric cancer prevention efforts grouped by WHO region: in Nigeria and Zambia (WHO African Region); Latin America and the Caribbean, the USA, and Arctic North America (WHO Region of the Americas); Europe (WHO European Region); Bhutan (WHO South-East Asia Region); and China, Japan, the Republic of Korea, the Matsu Islands, and Aotearoa New Zealand (WHO Western Pacific Region). In these subchapters, the need for preparatory steps before implementation of *H. pylori* screen-and-treat programmes was highlighted. These steps include setting up registries and infrastructure to collect information on gastric cancer, *H. pylori* prevalence, and antibiotic resistance patterns in the target populations. In addition, pilot studies in European countries highlighted the importance of population communication and awareness campaigns to increase participation in *H. pylori* screen-and-treat programmes and adherence to treatment.

Needs and readiness for the implementation of *H. pylori* screen-and-treat strategies for gastric cancer prevention locally

Assessment of needs and readiness is critical before implementing an *H. pylori* screen-and-treat programme. In areas with intermediate to high incidence of gastric cancer, a population-based *H. pylori* screen-and-treat programme should be considered a public health priority. In areas with a lower incidence of gastric cancer, *H. pylori* screen-and-treat programmes targeting intermediate-risk and high-risk groups will often be the best option for reducing the gastric cancer burden. Pilot projects, run before the implementation of a full programme, are crucial to assess the local level of readiness. For successful implementation of the programme, sustainable funding, governance, and leadership as well as additional infrastructure to support treatment delivery and overall programme implementation are required.

Considerations for choice of population-based *H. pylori* detection methods

The Working Group recommends that population-based *H. pylori* screening programmes use one or more of these three methods for *H. pylori* detection: the ^{13}C-

urea breath test (UBT), the stool antigen test (SAT), and the serology test. When selecting the screening test, the local context must be considered with respect to test performance, the prevalence of *H. pylori* infection, and other factors, such as infrastructure, participants' preferences, and costs. If serology is chosen for screening, a confirmatory UBT or SAT may be needed. Confirmation of success of *H. pylori* eradication, if undertaken, should be based on the UBT or the SAT at least 4 weeks after the completion of *H. pylori* therapy.

Considerations for choice of *H. pylori* treatment regimens

As participants enter the programme, they should be informed that the treatment is not uniformly successful in eradicating *H. pylori* infection or in preventing gastric cancer and that participation in the programme does not preclude routine medical care. *H. pylori* screen-positive individuals should receive information and counselling about the possible (generally mild) adverse events and the importance of completing the full course of treatment as prescribed. Screen-positive individuals should be treated with regimens informed by local *H. pylori* antibiotic resistance and treatment success rates. Bismuth-containing quadruple therapy is recommended as a first-line therapy, because it is unaffected by clarithromycin resistance and can overcome metronidazole resistance.

Antibiotic stewardship for population-based *H. pylori* screen-and-treat programmes, including testing of cure and monitoring of antibiotic resistance

The Working Group emphasized that population-based *H. pylori* screen-and-treat programmes for gastric cancer prevention should follow robust antibiotic stewardship principles, with oversight by a multidisciplinary group that monitors antibiotic use and resistance. When implementing a programme, a priori treatment success metrics should be established. *H. pylori* eradication rates should be assessed through systematic follow-up testing of treated individuals. *H. pylori* strains from a subset of participants should be tested for antibiotic resistance before and after programme implementation. The impact of increased exposure to antibiotics on the human microbiome, including the resistome, is not yet fully understood, and thus continued awareness, monitoring, and research are warranted. Further investment is needed to develop highly effective *H. pylori* therapies and vaccines. Policy-makers

implementing *H. pylori* screen-and-treat programmes must work to minimize the potential negative impacts of these programmes.

Process and outcome measures for improving the quality and equity of *H. pylori* screen-and-treat programmes for gastric cancer prevention

A population-based *H. pylori* screen-and-treat programme for gastric cancer prevention should adhere to the principles of an organized screening programme for effective and equitable outcomes across groups. The programme must be supported by an information system for data collection and generation of quality indicators. Quality indicators must be monitored to ensure and improve programme effectiveness, equity, safety, and cost–effectiveness. The Working Group emphasized that to ensure equity, at-risk communities should be involved in the design and governance of the *H. pylori* screen-and-treat programme.

How to optimize the cost–benefits of *H. pylori* screen-and-treat programmes for gastric cancer prevention

The Working Group concluded that the *H. pylori* screen-and-treat strategy is cost-effective (and may be cost saving) in high-risk settings. It is likely to be cost-effective even in low-risk settings. The optimal strategies (with respect to target population, *H. pylori* detection methods, age, confirmatory tests, and choice of treatment) depend on the local context. The Working Group emphasized the importance of decision modelling for making recommendations for the context-appropriate strategy based on information collected from local pilot projects. Long-term follow-up data on ancillary benefits and potential harms are needed to improve decision modelling, because these may play a significant role in the balance between the benefits, harms, and costs of *H. pylori* screen-and-treat programmes.

Conclusions

This Working Group Report, for the first time, comprehensively discussed and laid out essential considerations to be incorporated when implementing population-based *H. pylori* screen-and-treat strategies as an organized programme for gastric cancer prevention.

The Working Group emphasized that a population-based *H. pylori* screen-and-treat programme should be considered a public health priority in areas or populations

with elevated risk, for gastric cancer prevention. Assessment of needs and readiness at the local level by running pilot projects is essential before implementing the programme. Options for the screening test include the UBT, the SAT, and the serology test. The choice of treatment should be informed by local *H. pylori* antibiotic resistance data and eradication success rates, and the Working Group recommends bismuth-containing quadruple therapy as a first-line therapy. Ensuring and adopting robust antibiotic stewardship is of paramount importance for the success of the programmes, and further investment is urgently needed to develop highly effective *H. pylori* therapies and vaccines. The Working Group emphasized that *H. pylori* screen-and-treat programmes have the greatest chance of being equitable if the people with the highest rates of *H. pylori* infection participate and are successfully treated. Recognizing that the *H. pylori* screen-and-treat strategy is cost-effective for preventing gastric cancer, decision modelling is instrumental for recommending the context-appropriate strategy based on information collected from local pilot projects.

In the light of the increasing global burden of gastric cancer, driven by shifting epidemiological trends, the Working Group emphasized that prevention remains the most effective strategy for reducing this burden. Outlining essential considerations for implementing population-based *H. pylori* screen-and-treat programmes for gastric cancer prevention, this Working Group Report serves as a global reference for future development of evidence-based recommendations, best practice guidelines, and related quality assurance schemes.

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Reference

1. IARC *Helicobacter pylori* Working Group (2014). *Helicobacter pylori* eradication as a strategy for preventing gastric cancer (IARC Working Group Reports No. 8). Lyon, France: International Agency for Research on Cancer. Available from: https://publications.iarc.who.int/391.