Cancer Screening and Prevention **2025** vol. 4(4) | 159–161
DOI: 10.14218/CSP.2025.00027

Editorial

Bridging IARC Guidance to Practice: Implementation of *Helicobacter pylori* Screen-and-Treat Strategies for Gastric Cancer Prevention

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Received: November 18, 2025 | **Revised:** November 25, 2025 | **Accepted:** December 10, 2025 | **Published online:** December 18, 2025

Gastric cancer (GC), the fifth most common cancer and fifth leading cause of cancer-related mortality worldwide, remains a significant public health challenge.[1] Chronic infection with *Helicobacter pylori* (*H. pylori*) is a predominant etiological driver of gastric tumorigenesis.[2] Accumulating evidence from randomized controlled trials and meta-analyses shows that *H. pylori* eradication reduces GC risk.[3,4] In response, the International Agency for Research on Cancer (IARC) of the World Health Organization Working Group issued global guidance aimed at reducing the burden of GC, suggesting a prioritization of population-wide *H. pylori* screen-and-treat interventions.[5]

H. pylori screen-and-treat programs are being incrementally implemented in some GC high-risk Asian settings, such as the Matsu Islands, Bhutan, and Japan.[6–8] Meanwhile, in Europe, *H. pylori* screen-and-treat programs have been endorsed by Europe's Beating Cancer Plan, with two European Union projects, including EUROHELICAN ("Accelerating Gastric Cancer Reduction in Europe through *H. pylori* Eradication") and TOGAS ("Towards Gastric Cancer Screening Implementation in the European Union"), investigating the outcomes of their implementation.[5,9] Despite these encouraging regional initiatives, global implementation has progressed slowly. The IARC report underscored the need to tailor screen-and-treat strategies to local settings with diverse Human Development Index levels and disease burdens. Specifically, it recommended adopting population-wide *H. pylori* screen-and-treat programs in regions with intermediate to high incidence of GC, while prioritizing targeted approaches for low-incidence regions that focus on intermediate- and high-risk groups within selected administrative or geographical units.[5] Consistent with this framework, the Taipei Global Consensus II recently advocated prioritizing *H. pylori* detection and eradication among individuals at elevated risk, including adult residents of and immigrants from regions with high GC incidence.[10] Prior to the implementation of a full program, however, the report emphasized the need for pilot projects to assess local feasibility and readiness, as program success depends on sustainable funding, available testing and treatment resources, adequate infrastructure, and maximized engagement of the target population.[5]

The Working Group Report outlined practical considerations for screen-and-treat program implementation, including selection of diagnostic tests and treatment regimens. Options for *H. pylori* detection include the ^{13}C-urea breath test (UBT), stool antigen test (SAT), and serology test, and the choice should be guided by test performance, local *H. pylori* prevalence, operational feasibility, and budget constraints.[5] When serology is used for initial screening, positive findings should be confirmed with ^{13}C-UBT or SAT to distinguish current from past infection. Prior to *H. pylori* treatment, individuals with confirmed infection should receive counselling on potential adverse effects and the importance of adherence.[5] Classic bismuth-containing quadruple therapy is recommended as a first-line option, and successful eradication should be confirmed using ^{13}C-UBT or SAT at least four weeks after therapy completion. Vonoprazan–amoxicillin and high-dose proton pump inhibitor (PPI)–amoxicillin dual therapies have emerged as effective alternatives in East Asia, particularly in regions where bismuth, tetracycline, or the three-in-one single capsule is unavailable. These regimens are associated with fewer adverse effects and better compliance. However, given that these favorable outcomes have not yet been consistently replicated in European populations, further validation is required before they can be universally recommended outside Asian settings.

The report also underscored a clear imperative for the effective and sustainable implementation of population-based *H. pylori* screen-and-treat strategies. A central component of this implementation is robust antibiotic stewardship, given the rising threat of antimicrobial resistance. The Working Group emphasized that eradication regimens should be selected in accordance with local *H. pylori* resistance profiles and observed treatment effectiveness, supported by systematic follow-up testing of treated individuals to monitor eradication rates.[5] Continuous resistance surveillance to build accurate local antibiograms, together with efforts to develop new antimicrobial agents, would be essential to sustain long-term program effectiveness. In the longer term, a prophylactic *H. pylori*

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How to cite this article: Hong CL, Liu ZC, Li WQ. Bridging IARC Guidance to Practice: Implementation of *Helicobacter pylori* Screen-and-Treat Strategies for Gastric Cancer Prevention. *Cancer Screen Prev* 2025;4(4):159–161. doi: 10.14218/CSP.2025.00027.

vaccine represents the most promising strategy to overcome the inherent limitations of antibiotic-based therapy, although current development remains at the preclinical stage.

To ensure high-quality and equitable delivery, population-based screen-and-treat programs require strong information infrastructure capable of capturing key performance metrics at each stage, such as invitation coverage, participation rates, test positivity, and eradication success. Achieving high participation and treatment adherence among populations with the greatest infection burden is particularly critical for maximizing equity. Besides, the economic rationale should also be considered. The Working Group concluded that *H. pylori* screening and treatment is cost-effective for GC prevention even in lower-incidence regions, and that optimizing local cost-benefit profiles will depend on decision modelling informed by data from pilot studies to identify the most appropriate, context-specific implementation strategies.[5]

Although the IARC framework provides a clear roadmap for population-based *H. pylori* screen-and-treat strategies, challenges remain in translating recommendations into real-world practice. Important knowledge gaps persist regarding the systemic consequences of *H. pylori* eradication on the gastrointestinal microbiome and risks of other chronic diseases, which may require large-scale longitudinal studies to fully elucidate. Moreover, the complexity of gastric carcinogenesis, shaped by the interplay among host genetics, environmental exposures, and *H. pylori* infection, leads to considerable heterogeneity in prevention outcomes. This highlights the limitations of the "one-size-fits-all" approach and underscores the need for precision primary prevention approaches.[11] Our recent studies demonstrated that the protective effect of *H. pylori* eradication was markedly stronger among individuals at high genetic risk.[12,13] Accordingly, future clinical practice should integrate environmental exposures, genetic susceptibility, and host lifestyle factors for risk stratification. Such stratification is essential to identify the specific subpopulations that will derive the greatest preventive benefit from *H. pylori* eradication. Beyond individual-level precision approaches, household-level strategies are also gaining prominence.[14] Given the well-established family clustering and intrafamilial transmission of *H. pylori*, a family-based screen-and-treat approach has emerged as a promising option.[15,16] By testing and treating all family members of patients with GC or *H. pylori* infection, this approach yields higher eradication rates, lower reinfection rates, and better adherence to treatment.[17] Nevertheless, further well-designed randomized trials are required to provide robust evidence for the widespread implementation of family-based *H. pylori* screening and treatment.

In brief, the path forward must involve an integration of cutting-edge research and pragmatic public health actions to transform the promise of *H. pylori* screen-and-treat strategies into a global reality of GC prevention. Ideally, screen-and-treat programs should be tailored to regional needs. This is best exemplified by the situation in China, a country with a dual burden of *H. pylori* infection and GC, which represents a pivotal environment for testing and scaling the IARC's recommendations. Future efforts for GC prevention should concentrate on a phased strategy that prioritizes high-risk individuals before expanding to broader populations, while simultaneously refining risk prediction models for precision intervention. Success in this setting would not only advance local health goals but also provide essential blueprints for GC prevention worldwide.

Acknowledgments

None.

Funding

This work was supported by the Noncommunicable Chronic Diseases-National Science and Technology Major Project (2023ZD0501400-2023ZD0501402) and the National Natural Science Foundation of China (82273704).

Conflict of interest

One of the authors, Wen-Qing Li, serves as an associate editor of *Cancer Screening and Prevention*. The authors have no other conflicts of interest to note.

Author contributions

Study concept and design (CLH, ZCL, WQL), manuscript drafting (CLH, ZCL), and critical revision (WQL). All authors have made significant contributions to this study and have approved the final manuscript.

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