Introduction

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Background

In 2013, a Working Group convened by the International Agency for Research on Cancer (IARC) [1] to consider strategies for gastric cancer prevention through *Helicobacter pylori* eradication recommended introducing population-based *H. pylori* screen-and-treat programmes in conjunction with a scientific assessment of the programme's processes, feasibility, effectiveness, and possible adverse consequences. Other international guidelines and consensus reports [2, 3] have also recommended the implementation of *H. pylori* screen-and-treat programmes, especially in high-risk areas for gastric cancer. The strategy has additional benefits in reducing the prevalence of other important clinical conditions, such as peptic ulcer disease, dyspepsia, iron-deficiency anaemia, and idiopathic thrombocytopenic purpura. It also provides a key opportunity to address the inequalities associated with gastric cancer, even in low-risk areas for gastric cancer.

Population-based *H. pylor*i screen-and-treat programmes are being implemented, albeit slowly, in some Asian settings with a high prevalence of *H. pylori* infection, such as in the Matsu Islands [4], in Japan (through national insurance coverage of *H. pylori* treatment) [5], and in Bhutan [6]. In particular, Bhutan recently initiated two national programmes for gastric cancer prevention as part of its Health Flagship Programme: (i) population-based *H. pylori* screen-and-treat programmes for people aged 18–75 years, and (ii) population-based screening for precancerous lesions using upper endoscopy for people aged 40–75 years [6]. Other countries, such as China, Japan, and the Republic of Korea, continue to focus their efforts on population-based screening for gastric cancer using national or regional endoscopic screening programmes.

Population-based *H. pylori* screen-and-treat programmes are also seen as important tools for gastric cancer prevention in European Union countries, especially for countries with a high burden of gastric cancer. These programmes were endorsed in the recently announced Europe's Beating Cancer Plan and in

subsequent recommendations on the prevention of gastric cancer from Science Advice for Policy by European Academies [7] and the European Council [8].

The outcomes of the implementation of population-based *H. pylori* screen-and-treat programmes in high-risk areas of Europe will be investigated in two European Union projects for gastric cancer prevention that have been launched recently: Accelerating Gastric Cancer Reduction in Europe through *H. pylori* Eradication (EUROHELICAN) and Towards Gastric Cancer Screening Implementation in the European Union (TOGAS).

Despite the international guidelines and recent initiatives and interest in implementing *H. pylori* screen-and-treat programmes in asymptomatic populations for gastric cancer prevention in various regions, no global guidance is currently available on how to successfully implement and evaluate such programmes at the population level.

Objectives and scope

As part of the EUROHELICAN project, IARC convened a 3-day Working Group Meeting bringing together an international, interdisciplinary group of experts to discuss best practices in the implementation of population-based *H. pylori* screen-and-treat strategies for adult populations for gastric cancer prevention.

This IARC Working Group Report addresses population-based *H. pylori* screen-and-treat strategies as specific interventions for the primary prevention of gastric cancer. The scope and objective of the Working Group Report need to be distinguished from existing guidelines or consensus that have been developed within the context of clinical management of chronic infection with *H. pylori* and are therefore oriented towards treatment of *H. pylori*-related clinical manifestations. In addition, such strategies should be distinguished from the secondary prevention of gastric cancer by early detection of precancerous lesions (i.e. precancers) or invasive cancers and their treatment, which is often termed “gastric cancer screening”. To avoid confusion, clarification is always required as to whether the term “screen-and-treat” or “screening and treatment” refers to *H. pylori* infection (as is the case in this publication) or to precancerous lesions.

The scope of the Working Group Meeting and this Working Group Report is not limited to Europe but covers all world regions, including various levels of the Human

Development Index and background burdens of disease, to ensure that the guidance is globally applicable.

Structure of the report

Chapter 1 describes the global epidemiology of gastric cancer and *H. pylori* infection, based on the latest estimates from IARC's GLOBOCAN and *Cancer Incidence in Five Continents* databases. **Chapter 2** summarizes the scientific evidence on the effect of population-based *H. pylori* screen-and-treat strategies for gastric cancer prevention and the currently available guidelines and recommendations on the strategies. **Chapter 3** presents various gastric cancer prevention efforts for each World Health Organization (WHO) region and highlights the gaps in knowledge and the future efforts that are needed.

The subsequent chapters detail programmatic aspects of the strategies for implementation at the population level. **Chapter 4** provides an overview of the needs and readiness to implement *H. pylori* screen-and-treat strategies locally, **Chapter 5** presents considerations for selecting *H. pylori* detection methods, and **Chapter 6** discusses considerations for choosing treatment regimens for population-based implementation of *H. pylori* screen-and-treat strategies. **Chapter 7** discusses antibiotic stewardship, focusing on the key principles to ensure the appropriate use of antibiotics to fight against the global threat of antimicrobial resistance. **Chapter 8** proposes process and outcome measures for improving the quality and equity of the strategies, and **Chapter 9** discusses how to optimize the cost–benefits of population-based *H. pylori* screen-and-treat programmes for gastric cancer prevention.

Definitions

In **Chapters 1** and **3**, incidence, mortality, trends over time, and absolute burdens across countries and regions with different levels of the Human Development Index are described in terms of the numbers of new cases and deaths, and age-standardized rates (ASRs, world standard population) are used for international comparisons to account for differences in age structures. In other chapters, such as **Chapters 4** and **8**, in which the planning aspects of the strategies are discussed, crude and age-specific rates are also used to reflect the actual experience of the specific population and the true magnitude of the health risks, and to highlight high-risk subgroups that may warrant intervention [9].

Although the Working Group wanted to avoid endorsing strict (bright-line) criteria based on ASRs to define high risk or low risk of gastric cancer, in this publication incidence rates (ASR) of < 10 per 100 000 person-years are used as indicative of “low” risk, and incidence rates (ASR) of ≥ 10 per 100 000 person-years indicate populations with “intermediate to high” risk.

References

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