Helicobacter pylori and Gastric Cancer: Population-Level Prevention and Future Impact

Sayo Kawai (1)

1 : Department of Public Health, Aichi Medical University School of Medicine

Gastric cancer has long been one of the leading causes of cancer incidence and mortality in Japan, largely attributable to the historically high prevalence of *Helicobacter pylori* infection. Over the past several decades, however, Japan has experienced a marked decline in *H. pylori* infection, particularly among younger generations, reflecting improvements in hygiene and changes in early-life living environments that have reduced intrafamilial transmission. This epidemiological transition has led to a sustained decrease in gastric cancer incidence, particularly among populations with a historically high prevalence of *H. pylori* infection. This presentation focuses on the population-level impact of declining *H. pylori* infection on the gastric cancer burden in Japan, highlighting how shifts in infection dynamics across generations are reshaping the national risk profile of gastric cancer. In addition, we review the role of public health policies, including insurance-covered eradication therapy and adolescent screening programs, in accelerating the reduction of *H. pylori* infection at the population level. Furthermore, we briefly review recent epidemiological modeling studies that project future gastric cancer incidence in Japan under different scenarios of *H. pylori* eradication uptake. These models integrate infection prevalence and eradication rates to estimate the long-term preventive impact of current and enhanced control strategies. While substantial reductions in gastric cancer burden are expected in the coming decades, a considerable number of cases will persist among individuals with past infection, underscoring the importance of continued surveillance and risk-stratified prevention.

Biography

Sayo Kawai, PhD, is a Lecturer in the Department of Public Health, Aichi Medical University School of Medicine, Japan. Her research focuses on the epidemiology of Helicobacter pylori infection and gastric cancer, predictive modeling of future cancer burden, and the evaluation of population-level prevention strategies. She received her PhD (Medicine) from Nagoya University Graduate School of Medicine in 2008. She is involved in government-funded research projects and collaborates with local municipalities to forecast the long-term impact of adolescent H. pylori control.

Cervical cancer control in Korea: immunization against HPV and cervical cancer screening

Jin-Kyoung OH (1)

1 : National Cancer Center Graduate School of Cancer Science and Policy

Persistent infection with high-risk human papillomavirus (HPV) is the necessary cause of cervical cancer, making it one of the most preventable infection-related malignancies. In line with the global effort to reduce the burden of infection-associated cancers, Korea has implemented nationwide HPV immunization and an organized cervical cancer screening program. These initiatives align with the WHO Cervical Cancer Elimination Strategy, which calls for achieving 90% HPV vaccination coverage among girls by age 15, 70% screening coverage using a high-performance test by ages 35 and 45, and 90% access to treatment for precancer and cancer. Korea introduced HPV vaccination into the National Immunization Program in 2016, with gradual expansion of age eligibility and ongoing discussions about single-dose adoption. Although vaccination uptake has steadily increased, it remains below the level required to reach elimination targets. Screening participation among women aged 20–74 has been stable but shows disparities by age, socioeconomic status, and region. While national incidence and mortality from cervical cancer have declined over the past decades, recent stagnation among younger women suggests gaps in primary and secondary prevention that require renewed attention. This presentation reviews Korea's current progress in HPV immunization and cervical cancer screening within the broader framework of infection-related cancer prevention. It highlights remaining challenges—including vaccine hesitancy, inequitable screening participation, and limited awareness—and discusses opportunities to strengthen life-course approaches to prevention. Accelerating HPV vaccine rollout, improving access to high-quality screening, and enhancing public engagement will be essential for Korea to move toward the global goal of cervical cancer elimination.

Biography

Dr. Jin-Kyoung Oh, is a Professor in the Department of Public Health & AI at the Graduate School of Cancer Science and Policy, National Cancer Center Korea. She holds a PhD and MPH in Public Health from Seoul National University. Her research focuses on cancer epidemiology and prevention, with particular emphasis on infection-related cancers, population-attributable fractions, and the evaluation of HPV vaccination and other preventive interventions using population-based data. She serves on the Subcommittee on HPV of the Korea Advisory Committee on Immunization Practices and is an active member of major Korean epidemiology and cancer societies.

From Biomarker Discovery to Precision Prediction in Chronic Hepatitis B

Hwai-I Yang (1)

1 : Genomics Research Center (GRC) and Biomedical Translation Research Center (BioTReC), Academia Sinica

Despite the availability of effective vaccines, chronic hepatitis B virus (HBV) infection remains a major global health burden, affecting more than 260 million individuals worldwide. Chronic hepatitis B (CHB) follows a long and heterogeneous disease course, in which patients move through distinct biological and clinical states and may develop cirrhosis or hepatocellular carcinoma (HCC). Predicting both key disease milestones and malignant transformation is essential for precision prevention and management of CHB. Using large-scale, community-based prospective cohorts with long-term follow-up in Taiwan, particularly the REVEAL-HBV study, our work shows how biomarker discovery can clarify the natural history of CHB and enable individualized risk prediction. We identified and validated biomarkers across viral, host, immune, genetic, and environmental domains, including HBV DNA and HBeAg status, quantitative hepatitis B surface antigen, immunological markers such as quantitative anti-HBc and soluble PD-1, host genetic variants including NTCP and HLA polymorphisms, and environmental exposures such as fine particulate air pollution. Together, these biomarkers capture key aspects of viral activity, immune control, and host susceptibility underlying disease progression. Building on these findings, we developed and externally validated prediction models that translate population epidemiology into clinical decision-making. Milestone-oriented models characterize immune-mediated transitions such as HBeAg and HBsAg seroclearance, while HCC risk scores, including REACH-B for untreated patients and REAL-B for patients receiving oral antiviral therapy, provide long-term risk stratification to guide personalized surveillance and prevention strategies. Overall, this work illustrates how integrative biomarker strategies can shift CHB management from static disease categories toward dynamic risk assessment, enabling earlier intervention and more precise prevention of liver cancer.

Biography

Hwai-I Yang, PhD, is an epidemiologist and Associate Research Fellow at the Genomics Research Center, Academia Sinica, Taiwan, and currently serves as Director of the Taiwan Biobank. He received his PhD in Epidemiology from National Taiwan University. He has been a core investigator of the REVEAL-HBV cohort for over three decades, focusing on the natural history and risk prediction of chronic hepatitis B and liver cancer using population-based longitudinal data and genomic and molecular epidemiology. He has published more than 200 peer-reviewed articles with over 26,000 citations (h-index 63).