Effect of Missing Enrollment Registry on Vaccine Effectiveness based on NDB's Feature: VENUS Study

Taku Chikamochi (1)
Wataru Mimura (1), Chieko Ishiguro (1), Futoshi Oda (2), Megumi Maeda (2), Haruhisa Fukuda (2)

1 : Laboratory of Clinical Epidemiology, Department of Data Science, Center for Clinical Sciences, Japan Institute for Health Security
2 : Department of Health Care Administration and Management, Kyushu University Graduate School of Medical Sciences

Background : The linkage between the National Database (NDB), including medical claims, and the VDB, including vaccination records, is proceeding for assessment of vaccine effectiveness and safety in Japan. Influenza vaccination is mainly targeted at older adults aged ≥65 years; however, the medical claims-based study using NDB may not cover the population, as individuals who have not had medical claims cannot be identified due to a lack of enrollment registry. The study aimed to assess the difference in the estimated vaccine effectiveness between scenarios with and without an enrollment registry in older adults aged ≥65 years.

Methods : We performed a cohort study from October 1, 2022 to March 31, 2023 using data from four municipalities using the VENUS Study. We defined the three different scenarios based on the NDB characteristics using the VENUS data as follows: VENUS, NDB-mimic 1 (NDB1), and NDB-mimic 2 (NDB2). The VENUS included individuals regardless of whether they had medical claims, while NDB1 and NDB2 included only those with medical claims. In addition, VENUS and NDB1 identified death based on resident records, whereas NDB2 used medical claims. The exposure was influenza vaccination and outcomes were influenza, influenza-related hospitalization, and all-cause mortality. We estimated hazard ratios (HRs) for unvaccinated versus 0-13 days and ≥14 days after vaccination using a marginal structural Cox model with stabilized weights.

Results : Each scenario included 150,496, 145,219, and 148,338 individuals in VENUS, NDB1, and NDB2. The HRs for ≥14 days after vaccination were as follows: for influenza, 0.86 in VENUS, 0.86 in NDB1, and 0.87 in NDB2; for influenza-related hospitalization, 0.87, 0.88, and 0.90; and for all-cause mortality, 0.45, 0.42, and 0.39.

Conclusion : The HRs for each outcome showed that the impact of the lack of enrollment registry on influenza vaccine effectiveness would likely be limited among older adults.

Prevention education for Internet Addiction and inhibitory factors among middle school students

Masaaki Yamada (1)
Michikazu Sekine (1), Takashi Tatsuse (1)

1 : University of Toyama, Epidemiology and Health Policy

Objectives : Internet Addiction is an imminent public health concern worldwide. The number of prevention education for Internet Addiction (IA) at school is increasing: however, the study assessing the impact is limited. We aimed to explore the impact of the prevention education and clarify the inhibitory factors of individual students.

Methods : We conducted a prevention education for IA at 10 middle schools in Toyama and other prefectures. The lecture included the basic of addiction, brain change, and way to prevent IA. After the lecture, a questionnaire survey was distributed to students. The survey was about lifestyle, recreational Internet time on a weekday (<2h, ≥2h, ≥3h, ≥4h, ≥5h, ≥6h), IA score (YDQ8), family rule, and the response to IA lecture: (1) recognition of the risk of IA and (2) willingness of reducing Internet time. Non-responders of the two were set as dependent variables, respectively, and logistic regression analyses were performed.

Results : Out of 3375, 86.6% of students answered our questionnaire, and finally, 2473 students were analyzed (73.3%). Of all, 22.3% students spent ≥ 4h for Internet. The prevalence of IA (YDQ ≥5) was 14.2%. Regarding response to the lectures, 3.6% and 11.1% of students were non-responders in the recognition of risk and the willingness to reduce, respectively. In the two regression analyses, non-responders were commonly associated with boys (OR 2.34 in recognition and OR 1.97 in willingness) and prolonged (≥4h, ≥5h, >6h) Internet time (OR 2.33 to 5.63 in recognition and OR 2.55 to 5.20 in willingness).

Conclusions : Prevention education for IA was effective to most students (96.4% in recognition and 88.9% in willingness). Boy and Internet time for ≥4h were considered to be inhibitory factors toward the prevention education. To make preventive education effective, Internet time for ≥4h should be avoided from the daily lives.

Comparing Psychiatric Inpatients in Public Assistance Recipients Using Official Japanese Statistics

Hideyuki Watanabe (1)
Kotaro Kuwaki (2), Shinichi Tanihara (2)

1 : Kurume University / Graduate School of Medicine / Department of Public Health
2 : Kurume University / School of Medicine / Department of Public Health

Background : In Japan, multiple government statistics on healthcare utilization exist, but most rely on survey responses from medical institutions, require effort to collect, and cannot be integrated across surveys. In this study, we focused on psychiatric hospitalization among public assistance recipients (PAR) as an example and estimated inpatient numbers using different government statistics to clarify discrepancies and structural issues across data sources.

Methods : We used three government statistics: *630 Survey* (census of psychiatric beds), *Patient Survey* (nationwide stratified sample), and *Fact-finding Survey on Medical Assistance* (*FSMA*, census based on electronic claims of PAR). We grouped psychiatric disorders according to ICD-10 codes: V-1. Schizophrenia disorders (F20–29), V-2. Mood disorders (F30–39), and V-3. Neurotic disorders (F40–48). Using these data, we estimated and compared the average daily psychiatric inpatients among PAR in 2023.

Results : In *630 Survey*, the inpatient numbers were 127,225, 25,021, and 4,664 for V-1–V-3. In *Patient Survey*, the corresponding estimates were 126,300, 26,700, and 5,500. Applying the proportion of public assistance recipients from *630 Survey* to these national estimates, the average daily inpatient numbers among PAR were 22,436, 3,249, and 941. In contrast, based on *FSMA*, the estimated numbers were 10,784, 1,427, and 382, respectively.

Discussion・Conclusion : This study highlighted the limitations of government statistics through the estimation of psychiatric inpatients among PAR. *630 Survey* and *Patient Survey* may lack accuracy because they rely on institutional responses, while *FSMA* provides more accurate figures from claims data but may not reflect the primary reason for hospitalization. As a result, estimates can vary by data source, potentially influencing policy planning. Users must understand each dataset, and the government should establish a nationwide data system ensuring comparability.

The causal relationship between respiratory diseases, gastric cancer, and Helicobacter pylori

Wanhyung Lee (1)
Youjin Kim (2), Seunghyun Lee (3)

1 : Department of Preventive Medicine, College of Medicine, Chung-Ang University, Seoul, Republic of Korea
2 : Asan Medical Center, University of Ulsan College of Medicine, Seoul, Republic of Korea
3 : Department of Convergence Medicine, Pusan National University, Pusan, Republic of Korea

Background : Gastric cancer is a global health concern with multifactorial causes. While links between respiratory diseases and gastric cancer have been suggested, evidence remains limited. Conditions such as asthma, COPD, idiopathic pulmonary fibrosis (IPF), and lung diseases due to external agents (LDEA) arise from both genetic and environmental factors. Their genetic liability may reflect shared immune-inflammatory pathways influencing susceptibility to gastric cancer and gastrointestinal infections, including *Helicobacter pylori* (*H. pylori*). This study examined whether genetic susceptibility to respiratory diseases is associated with gastric cancer and *H. pylori* infection.

Methods : We conducted a two-sample Mendelian randomization analysis using genetic variants as instrumental variables to assess causal associations between respiratory diseases and risk of gastric cancer and *H. pylori* infection. GWAS summary statistics for respiratory diseases were obtained from FinnGen, and for gastric cancer and *H. pylori* infection from the UK Biobank. Analyses were adjusted for confounders such as smoking and alcohol consumption. Sensitivity analyses evaluatedrobustness and assessed potential pleiotropy and heterogeneity among genetic variants.

Results : No significant direct causal associations were found between respiratory diseases and gastric cancer risk. However, asthma and LDEA were significantly associated with increased risk of *H. pylori* infection. No associations were observed for COPD or IPF with either outcome. Sensitivity analyses indicated minimal pleiotropic or heterogeneity effects.

Conclusion : This study investigated genetic susceptibility to respiratory diseases and their potential links to gastric cancer and *H. pylori* infection. While direct genetic evidence linking respiratory disease susceptibility to gastric cancer was limited, significant associations with *H. pylori* infection suggest possible indirect pathways involving respiratory diseases.

Potential COPD Burden Reduction under Tobacco Control Scenarios: Projections Using GBD Data

Takafumi Yamamoto (1)
Shuhei Nomura (2), Masanori Iwasaki (3), Takahiro Tabuchi (4)

1 : Hokkaido University Hospital, Preventive dentistry
2 : Keio University, Global Research Institute
3 : Hokkaido University, Faculty of Dental Medicine and Graduate School of Dental Medicine, Department of Preventive Dentistry
4 : Tohoku University Graduate School of Medicine, School of Public Health, Division of Epidemiology

Introduction : Smoking is a major risk factor for chronic obstructive pulmonary disease (COPD) and a critical public health concern. However, the extent to which tobacco control can reduce the health burden of COPD remains unclear.

Methods: Using Global Burden of Disease (GBD) data from 1990 to 2021, we applied ARIMAX models to examine how changes in the summary exposure value (SEV) for smoking could affect COPD-related disability-adjusted life years (DALYs, per 100,000) to 2050. Adults aged 55 years and older, the age group most susceptible to COPD onset, were analyzed. To avoid multicollinearity, annual differences in smoking SEV were used as predictors. The sociodemographic index (SDI) was included as a covariate. Two hypothetical scenarios were evaluated: MIN, assuming the largest annual decline in smoking SEV between 1990 and 2021 continues to 2050, and MEDIAN, assuming the yearly median decrease continues. Analyses were stratified by sex (both, male, female).

Results : From 1999 to 2021, COPD DALYs decreased by 24.3% overall (933.4 to 706.5 per 100,000), by 21.9% in males (1578.7 to 1232.2), and by 36.1% in females (418.5 to 267.6). During the same period, smoking SEV declined by 48.9% overall, 51.8% in males, and 41.0% in females. By 2050, the projected DALYs under the MEDIAN scenario were 588.1 (95% Confidence interval (CI): 210.4–1644.0) for both sexes, 1092.7 (385.0–3101.2) for males, and 191.1 (48.6–751.3) for females. Under the MIN scenario, the respective estimates were 450.1 (161.0–1258.2), 839.9 (295.9–2383.8), and 191.7 (48.7–753.7). The absolute difference between scenarios was 138.0 overall, 252.8 in males, and –0.6 in females, corresponding to relative differences of 23.5%, 23.1%, and –0.3%.

Conclusion : Under the scenario assuming the greatest annual decline in smoking SEV, COPD-related DALYs in 2050 were projected to be up to 24% lower than under the median-decline scenario, with particularly pronounced benefits among men.