A Method to Estimate Ascertainment Bias from Temporal Relationship between Reported and Severe Cases

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Background and Aims : Ascertainment bias, the error that is introduced by under-observation and underreporting of observed infections, poses a critical challenge in quantifying the transmission dynamics of COVID-19. We aimed to develop a model to quantify the ascertainment bias by analyzing two routinely collected time series datasets.

Methods : We explored the temporal relationship between reported confirmed cases and severe cases, the latter defined as either admission to the intensive care unit or undertaking mechanical ventilation. Assuming that the time from reported infection to severe outcome follows an exponential distribution, we show that the true incidence of infection can be estimated using the third-order time derivative of severe case prevalence, assuming a stable severity rate throughout the course of observation. To better reflect biological severity, we further adjusted the reported severe cases by the fraction of elderly deaths that never experienced admission to the ICU or intubation. The model was applied to age-stratified data from Dec 2020 to Apr 2023.

Results : Among the elderly aged ≥60 years old, multipliers of observed cases due to ascertainment bias were 5.6 (95% CI: 3.1–8.7), 8.1 (95% CI: 6.0–11.5), and 10.9 (95% CI: 7.2–16.5), during the BA1/2, BA4/5, and XBB Omicron waves, respectively. For those <60 years, the corresponding multipliers were 10.9 (95% CI: 3.5–15.3), 7.7 (95% CI: 2.3–12.5), and 9.7 (95% CI: 2.8–22.1).

Implications : The model's 2021 estimates were broadly consistent with seroepidemiological estimates, while higher 2023 values suggested the presence of reinfections.

Association between Time Interval from Diagnosis to Treatment and Fatality in Gastric Cancer by Stage in Korea

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Background : Gastric cancer (GC) remains one of the leading causes of cancer burden worldwide. Treatment delay, defined as the interval from diagnosis to initiation of treatment, has been suggested to adversely affect prognosis. This study examined the association between treatment delay and fatality among GC patients in Korea, stratified by cancer stage.

Methods : We conducted a retrospective cohort study using the K-CURE Cancer Public Library Database. Patients diagnosed with GC between 2012 and 2019 were included, and death was followed until the end of 2021. Treatment delay was categorized into ≤30, 31–60, 61–90, and >90 days. Cumulative fatality was estimated using the Kaplan–Meier method with log-rank tests. Adjusted hazard ratios (aHRs) and 95% confidence intervals (CIs) were calculated using Cox proportional hazards models. Analyses were stratified by SEER summary stage (localized, regional, distant).

Results : A total of 30,390 patients were analyzed (localized: 20,172; regional: 8,334; distant: 1,884). Longer delays were associated with significantly higher 5-year fatality. In the localized stage, delays of 31–60 days (aHR: 1.38, 95% CI: 1.25–1.52) and 61–90 days (1.37, 1.20–1.58) were associated with an increased risk of death. In the regional stage, the highest risk was observed with a 61–90-day delay (1.70, 1.48–1.96). In the distant stage, delays of 31–60 days (1.31, 1.17–1.46) and >90 days (1.38, 1.13–1.70) were also associated with an increased risk of death.

Conclusion : Treatment delay was significantly associated with higher fatality in GC patients, particularly in the regional stage. These findings underscore the importance of timely treatment initiation and may inform clinical strategies to minimize delays and improve outcomes.

Insurance Type and Beneficiary Status and Survival in Working-Age Patients With Cancer in Japan

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Background and objective : Japan provides universal health coverage through Employees' Health Insurance (EHI) for employees and National Health Insurance (NHI) for others. Many EHI plans offer additional health checkups, which may influence cancer detection and outcomes. Screening participation differs between employees and dependents. We investigated whether insurance type and beneficiary status affect survival among working-age patients with cancer.

Methods : We used cancer registry and administrative data from 36 hospitals with the support of the Council for Coordination of Designated Cancer Care Hospitals in Osaka. Patients aged 20 to 60 years who were diagnosed with cancer between 2010 and 2015 were included. Insurance was classified as NHI, EHI employees, or EHI dependents. We compared proportions of screen-detected and localized cancers, and calculated sex-stratified, age-adjusted hazard ratios (HRs) for all-cause mortality using Cox models.

Results : The analysis included 20,845 individuals (8,407 men and 12,438 women). The distribution by insurance category (NHI / EHI dependents / EHI employees) was as follows: men, 2,312 (27.5%) / 202 (2.4%) / 5,893 (70.1%); women, 3,248 (26.1%) / 4,515 (36.3%) / 4,675 (37.6%). The screening cancer detection rates (%) were 8.6 / 5.9 / 25.7 for men and 13.2 / 19.0 / 25.5 for women. The proportions of localized cancer were 37.1 / 42.6 / 48.9 for men and 46.7 / 51.5 / 53.9 for women. Using NHI as the reference, the hazard ratios (95% CI) for 3-year all-cause mortality (EHI dependents / EHI employees) were 1.09 (0.78–1.49) / 0.59 (0.53–0.66) for men and 0.74 (0.64–0.85) / 0.67 (0.58–0.78) for women.

Conclusions : Excluding men EHI dependents, EHI members had better prognosis than NHI patients, possibly due to higher screening uptake and earlier diagnosis. Differences between employees and dependents varied by sex, suggesting that both insurance type and sex-related health behaviors may play a role in cancer outcomes.

Incidental Detection of Upper Gastrointestinal Cancers During Endoscopic Gastric Cancer Screening

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Background : Japan has no organized population-based screening for head and neck or esophageal cancers. Endoscopic gastric cancer screening may incidentally detect lesions beyond the stomach, but evidence is limited.

Methods : We linked municipal gastric cancer screening records with the Kokuho Database (KDB) in Okayama City. Beneficiaries aged ≥50 years at the end of fiscal year 2021 who underwent gastric cancer screening between April 2014 and March 2022 were included. Cancers of the oral cavity, pharynx, larynx, esophagus, or stomach diagnosed within 3 months after screening were considered screen-detected. Individuals with these cancers at their first screening were excluded. Screening episodes and diagnoses were summarized. Adjusted risk ratios (aRRs) were estimated using two-level modified Poisson models—screening episodes (level 1) nested within individuals (level 2)—adjusted for age and sex.

Results : Among 277,346 eligible beneficiaries, 36,339 underwent screening. A total of 40,909 radiography and 24,112 endoscopy episodes were recorded. Compared with radiography, endoscopy was associated with higher screen-detection of esophageal cancer (aRR 3.58, 95% CI 1.67–7.69) and gastric cancer (aRR 2.58, 95% CI 2.19–3.71). For oral cancer (aRR 1.25, 95% CI 0.27–5.69), pharyngeal cancer (aRR 2.60, 95% CI 0.43–15.7), and laryngeal cancer (aRR 0.72, 95% CI 0.14–3.71), detection was comparable to radiography.

Conclusions : In this municipal program, endoscopic gastric cancer screening detected more esophageal and gastric cancers than radiography. For oral and pharyngolaryngeal cancers, detection was similar between the two modalities. These results suggest incidental detection beyond the stomach, but larger studies are required to clarify the findings.

Association Between Eating Speed and 5-Year Risk of MASLD: Findings from the Aichi Workers' Cohort

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Objective : This study aimed to investigate the association between eating speed and the 5-year incidence of steatotic liver disease (SLD) and metabolic dysfunction-associated steatotic liver disease (MASLD).

Methods : The study included 3,449 government workers (77.2% men) aged 33–60 in Aichi Prefecture, Japan, enrolled in 2008. Eating speed was self-reported in five categories: "very fast," "relatively fast," "medium," "relatively slow," and "very slow." SLD was defined as a Fatty Liver Index (FLI) ≥60. MASLD was defined as SLD plus ≥1 metabolic abnormalities: (i) overweight/obesity (body mass index ≥25 kg/m^2 or waist circumference ≥85 cm for men and ≥90 cm for women); (ii) fasting plasma glucose ≥100 mg/dL, HbA1c ≥5.7%, or history/treatment of diabetes; (iii) blood pressure ≥130/85 mmHg or antihypertensive use; (iv) triglycerides ≥150 mg/dL or lipid-lowering therapy; or (v) high density lipoprotein cholesterol <40 mg/dL in men or <50 mg/dL in women or lipid-lowering therapy. Cox proportional hazards models estimated hazard ratios (HRs) and 95% confidence intervals (CIs), adjusting for age, sex, alcohol consumption, current smoking status, physical activity, tendency to eat until full, and histories of hypertension, diabetes, and dyslipidemia.

Results : Over a mean follow-up of 4.7 years, 414 participants developed SLD and 336 developed MASLD, corresponding to incidence rates of 28.9 and 21.2 per 1000 person-years, respectively. Compared with medium-speed eaters, relatively fast eaters had increased risks of SLD (HR: 1.34, 95% CI: 1.07–1.70) and MASLD (HR: 1.43, 1.11–1.86), while very fast eaters had the highest risks (SLD: HR: 1.68, 1.25–2.26; MASLD: HR: 1.78, 1.28–2.48). Very slow and relatively slow eating were not significantly associated with either outcome.

Conclusion : Eating speed may be a modifiable behavioral target for preventing MASLD in middle-aged adults.