Case and infection fatality rates of COVID-19 during the Omicron-dominant period in Korea, 2022-2023

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Background : Estimating fatality risks during pandemics is essential for understanding disease burden and informing policy. Most COVID-19 infection fatality rate (IFR) estimates were derived during the Delta-dominant phase and did not consider the infection window captured through serosurveillance. We estimated case fatality rates (CFRs) and IFRs in South Korea under varying assumptions about infection windows.

Methods : We used data from two waves of the nationally representative serosurvey, confirmed case reports and COVID-19 death records among individuals aged ≥10 years. Infections were estimated under three scenarios: (a) no waning from the start of the pandemic (20 Jan 2020), (b) waning after 310 days, and (c) waning after 210 days. For each, we calculated the proportion of unreported infections, CFRs, and IFRs by age.

Results : Under the no-waning scenario, anti-N seroprevalence was 56.1% in August 2022 and 78.0% in April 2023. Unreported infections ranged from 17.6-21.1% in wave 1 and 20.3-64.8% in wave 3, depending on the infection window. Adults aged 40-60 years had the highest underreporting. IFRs declined from wave 1 (115.3 per 100,000) to wave 3 (107.6 per 100,000), with CFR:IFR ratios remaining stable (1.4-1.5) under the no-waning assumption. Shorter windows produced implausible CFR:IFR estimates in wave 3.

Conclusions : Our findings support the use of infection windows exceeding two years in serosurveillance-based IFR estimation. However, IFR estimates remain sensitive to assumptions about variant characteristics, epidemic size, and testing patterns. Contextual interpretation is essential when using serological data for pandemic assessments.

Social Participation and Life Satisfaction in Aged Japanese Communities: Cross-Sectional Study

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Background : Japan's rapid population ageing highlights the need to identify social activities that support well-being in later life. This study examined associations between different types of social engagement and life satisfaction among residents of two highly aged Japanese "new town" communities.

Methods : In early 2022, a self-administered questionnaire was delivered to all households, and 1,353 adults responded. Participants reported weekly frequency of involvement in five activity types: volunteer work, sports or exercise groups, hobby gatherings, study circles, and skill-sharing events. Responses were recorded on a six-point scale and converted to sessions per week. Life satisfaction was assessed with a single binary question. Bayesian logistic regression estimated adjusted odds ratios (ORs) for life satisfaction per one unit increase in weekly participation, controlling for residential area, age, sex, living arrangement, self-rated health, and long-term care certification. Analyses were stratified by sex and age group.

Results : Greater participation in volunteering was associated with higher odds of life satisfaction (OR 2.44; 95% credible interval 1.21 to 6.70). Sports or exercise groups also showed a positive association (OR 1.36; 95% credible interval 1.06 to 1.83). Hobby activities, study circles, and skill-sharing events showed no consistent links. Associations were stronger among men and those aged 65 years or older.

Discussion : Volunteering and organized physical activity may enhance life satisfaction by providing meaningful roles, expanding social networks, and improving mood, especially for older men who lose work connections after retirement. Leisure-oriented activities appeared to have fewer benefits.

Conclusion : Programs that encourage volunteering and group-based exercise could promote life satisfaction in highly aged communities. Longitudinal and intervention studies are needed to confirm causality and guide program development.

Association between serum n-3 polyunsaturated fatty acids and brain volume in general Japanese women

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Background : Prior studies have linked circulating n-3 PUFAs, particularly DHA, to brain volume, evidence remains limited and is largely based on Western populations. Data from Japanese individuals, who typically have higher fish intake, are scarce.

Objective : To examine the association between circulating n-3 PUFAs concentrations and brain volume in Japanese women.

Methods : This cross-sectional study included 527 community-dwelling women aged 60-85 years residing in Kusatsu City, Shiga, Japan. Serum concentrations of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) were measured using gas chromatography, and their sum was defined as n-3 PUFAs. Brain volume (total brain, gray matter, white matter, and hippocampal volume) was calculated from magnetic resonance (MR) images obtained using a 1.5-tesla MR system. Analysis of covariance was performed to compare the adjusted mean values for brain volume according to the quartile of EPA, DHA, and n-3 PUFAs concentrations. Covariates included age, total intracranial volume, smoking and drinking status, step count, diabetes, hypertension, and statin use.

Results : The mean age of participants was 74.2 years. Serum concentrations of DHA were significantly and positively associated with gray matter volume (p for trend = 0.036), whereas EPA levels were not. Notably, serum levels of n-3 PUFAs showed a positive trend with gray matter volume (p for trend = 0.085). No significant associations were found between EPA, DHA, or total n-3 PUFA concentrations and white matter volume, total brain volume, or hippocampal volume.

Conclusion : DHA appears to play a key role in preserving gray matter volume in aging Japanese women, supporting the importance of DHA-rich diets for healthy brain aging.

Validity and reproducibility of food frequency questionnaire to assess ultra-processed food intake

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Background : Ultra-processed food (UPF) intake can be associated with elevated disease and mortality risk. Because UPF intake in Japan may differ from that in Western countries, its distribution and association with health outcomes should be assessed. We evaluated the validity and reproducibility of UPF and processed food (PF) intakes estimated using a food frequency questionnaire (FFQ) in Japanese adults.

Methods : A total of 240 men and women aged 40-74 years participated in the Japan Public Health Center-based Prospective Study for the Next Generation protocol. We collected 12-day diet records (DRs) and administered two FFQs from 2012-2013. We calculated the proportions of UPF and PF intakes in the total intake per food item from the 12-day DRs and estimated the UPF and PF intakes from the FFQ using these proportions. We assessed the validity of the estimated UPF and PF intakes from the FFQ by comparing them with those from the DRs using Spearman's rank correlation. Correlations were computed using crude and energy-adjusted intakes and optimism-corrected by cross-validation to prevent an overestimation of the validity because the development and verification populations were the same. The reproducibility was examined using Spearman's rank correlation between the first and second FFQs at yearly intervals.

Results : The mean UPF and PF intakes estimated from the FFQ were 15% and 24% higher, respectively, than those estimated from the DRs. Overestimation was greater for women than for men. The respective optimism-corrected correlations of energy-adjusted UPF and PF intakes between the FFQ and DRs were 0.37-0.45 and 0.46-0.53, respectively. For reproducibility, the correlations between the two FFQs for energy-adjusted UPF and PF intakes were 0.54-0.59 and 0.61-0.64, respectively.

Conclusion : Estimated UPF and PF intakes from FFQ responses demonstrated acceptable validity and reproducibility for use in future epidemiological studies on UPF-disease associations.