# Municipal preventive programs and long-term care: Nationwide survey in Japan during COVID-19

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**Background :** The COVID-19 pandemic disrupted community-based preventive programs for older adults, potentially accelerating functional decline and long-term care (LTC) needs. The population-level impact of municipal program implementation on LTC certification rates remains unclear.

**Methods :** A nationwide questionnaire was sent to all 1,741 municipalities in Japan in November–December 2021, with 1,121 responses (64.4%). These were linked to LTC certification statistics through March 2024. After excluding missing data, 1,004 municipalities remained. Outcomes were LTC certification rates from 2018 to 2023. Domains were physical activity, social participation, cognitive training, nutrition, and health check-ups. Implementation was classified as none, partial, or full. Collapsed difference-in-differences models (full vs. non-complete) and event-study models by year were applied, adjusting for baseline LTC rate, aging rate, log(population), and fiscal capacity index.

**Results :** Of the 1,004 municipalities, 155 (15.4%) fully implemented programs during COVID-19; most only partially or discontinued. In 2020–2021, municipalities with full physical activity programs showed suppressed LTC rate increases vs. non-complete (–0.20 percentage points; 95% CI: –0.36, –0.03). Cognitive training also had protective effects (–0.19 pp; 95% CI: –0.34, –0.04). Event-study analyses indicated these benefits persisted into 2022–2023, with further reductions for physical activity (2023: –0.30 pp; 95% CI: –0.54, –0.05) and cognitive training (2023: –0.20 pp; 95% CI: –0.43, 0.03). No consistent associations were found for social participation, nutrition, or health check-ups.

**Conclusion :** Nationwide municipal data suggest that full implementation of physical activity and cognitive training programs helped suppress LTC certification rate increases during and after COVID-19. Maintaining comprehensive preventive services, even under emergencies, may mitigate future care needs among older adults.

# Average slope angles of residential areas and falls: The cross-sectional study of Kyoto residents

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**Background** : Falls among elderly are a major public health issue, as they can influence both physical and cognitive functions, and reduce the quality of life. Previous studies suggest various risk factors of falls, namely aging and diseases as internal factors, and environments and behaviors as external factors. However, associations of geographical information, particularly slope of residential area, with falls has not been studied enough.

**Objective** : To examine associations between average slope angles of residential areas and falls.

**Methods** : We analyzed 2,829 subjects (1,935 women) with completed data for current analyses. Town-level mean slope angles of residential areas were obtained from open data using the geographic information system (QGIS-LTR 3.40). Slope angles above the 95th percentile were excluded as outliers, since such areas are likely to include uninhabited mountain regions. The $\log_2$ transformed angles were used in analyses. Experiences of falls in the past month were obtained from questionnaires. Odds ratio for a doubling in slope angles was obtained by logistic regression analysis adjusting for age, sex, education year, sleep quality, and histories of myocardial infarction and stroke.

**Result** : Mean age of subjects was 58.4 yr, and 118 of them (4.2%) reported falls. Mean of slope angles was 1.25° . Larger slope angles were associated with a lower risk of falls (adjusted OR=0.83, P=0.014). This association was strengthened among elderly (age≧65, N=1,025) (adjusted OR=0.66, P<0.001).

**Conclusion** : The steeper slope at residual area was significantly associated with lower risk of falls independently of common factors for falls, such as age, sex, sleep, and comorbidities. It is probable that novel protective factors against fall exist in lives in areas with steeper slope. We try to identify the probable factors by adding other geographic information to analyses, for example public transportation networks in communities with high/low slope angles.

# What drives respondents to seroepidemiological surveys? Insights from COVID-19 for future pandemics

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**Background :** Non-random participation can undermine the representativeness of seroepidemiological surveys. Despite their critical role in estimating disease spread during pandemics, non-response bias and methods to correct it require further investigation. This study aimed to examine sociodemographic characteristics and COVID-19-related factors influencing participation in a seroepidemiological survey.

**Methods :** We analyzed data from a national COVID-19 seroepidemiological survey in Japan between December 2022 and March 2023. We performed multivariable logistic regression analyses to estimate adjusted odds ratios (AOR) and their confidence intervals (CIs) after variable selection with the Group Least Absolute Shrinkage and Selection Operator.

**Results :** Among 6,091 participants, factors associated with higher odds of seroepidemiological surveys participation included being female (AOR 2.08 [95% CI, 1.25-3.47]), living in larger households versus living alone (two: 2.34 [1.20-4.55]; four or above: 2.05 [1.03-4.06]), higher education levels versus junior high school education (high school: 2.66 [1.06-6.15]; junior colleges, technical colleges, vocational schools: 5.51 [1.94-15.07]; university and above: 3.30 [1.26-7.98]), and having a higher household income versus earning <2 million yen (2–4 million yen: 3.32 [1.52-7.33]; 4–6 million yen: 2.73 [1.2-6.23], ³6 million yen: 4.51 [1.91-10.59]). Lower seroepidemiological survey participation odds were observed in those hesitant or unwilling to vaccinate (0.16 [0.09-0.29]) and those perceiving a higher COVID-19 positivity rate among close contacts (0.98 [0.98-0.99]).

**Conclusions :** Education, income, household size, sex, vaccination status, and perceived infection risk influenced seroepidemiological survey participation. The findings highlight the need to account for non-response bias using weighted methods like inverse probability weighting.

**Keywords :** COVID-19, non-respondent bias, seroepidemiological survey, pandemic.

# Psychological distress and turnover among young workers：YURAGI-J-Study

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**Backgrounds** : Mental health issues such as psychological distress are considered to be one of the factors contributing to job turnover, but their impact on job turnover among younger generations remains unclear. Furthermore, the relationship with mid-year job turnover is unclear. Therefore, this study aimed to clarify the relationship between mental health problems at baseline and job turnover within three months thereafter, focusing on young workers.

**Methods** : The study design was a prospective cohort study. Five anonymous web surveys were conducted every two weeks from the baseline (May) to 18- to 29-year-olds registered with a web survey company's panel throughout Japan. All variables were analyzed for respondents who answered all questions, excluding those who provided inappropriate answers or did not work. The outcome variable was job resignation (defined as the presence or absence of resignation experience within the past two weeks at Waves 1–5). The explanatory variable was the K6 score at baseline in May, with a cutoff of 5 points which is considered the threshold for psychological distress. In this analysis, we included sex, age, educational attainment, and economic conditions as covariates. A survival time analysis was conducted using the Cox proportional hazards model.

**Results** : The final analysis included 396 participants. Survival time analysis showed no association between baseline mental health problems and resignation within approximately three months (HR = 0.59, 95% CI: 0.17–2.07, p = 0.41).

**Conclusions** : This study did not clarify the relationship between psychological burden and mid-year turnover among younger workers. Future research should involve larger sample sizes, improved recruitment strategies, and the use of longer-term longitudinal data to further investigate this issue.

# Latent Clusters in Response Trajectories following Specific Health Guidance in Japan

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**Background :** Specific health guidance (SHG) has been implemented in Japan to prevent lifestyle-related diseases, with a focus on metabolic syndrome. Starting in 2024, SHG is evaluated based on targets related to waist circumference and body weight. This study aims to clarify which baseline profiles are associated with the achievement of these targets and how they relate to subsequent health trajectories.

**Methods :** We analyzed data from individuals aged 35 to 65 who received SHG between 2015 and 2023, provided by the Japan Health Insurance Association. Odds ratios for achieving both a 2 kg reduction in body weight and a 2 cm reduction in waist circumference were estimated based on participants' profiles and responses to lifestyle questionnaires before and after SHG. Latent baseline clusters were identified, and trajectory clusters were estimated for participants who measured at time points after SHG.

**Results :** Among 363,065 SHG participants, achievement rates were higher among younger, heavier, and first-time participants. Six baseline clusters and several trajectory clusters were identified. Trajectories showing improvements in body weight, blood pressure, and triglyceride level were observed for younger clusters even among those with abnormal liver function test results. Participants with low baseline weight and height were less likely to show improvements in these parameters but may benefit from targeted interventions to address lipid abnormalities after SHG.

**Conclusion :** Our analysis identified profiles and revealed heterogeneity in responses following SHG. Baseline profiling may offer a predictive approach for evaluating the effectiveness of SHG interventions.