# Social disconnection and suicide mortality across follow-up periods: a JAGES 12-year follow-up study

**Masashige Saito** (1,2)
Toshiyuki Ojima (3), Masaki Fukusada (2), Katsunori Kondo (4,5)

1 : Nihon Fukushi University / Faculty of Social Welfare
2 : Nihon Fukushi University / Center for Well-being and Society
3 : Hamamatsu University School of Medicine / Department of Community Health and Preventive Medicine
4 : Chiba University / Center for Preventive Medical Sciences
5 : Institute for Health Economics and Policy

**Objective :** This study investigated differences in suicide mortality associated with social disconnection across varying follow-up periods, using data from a large-scale cohort of older Japanese adults.

**Methods :** We conducted a nationwide baseline survey (2010–2011) of functionally independent adults aged ≥65 years from eight municipalities in Japan. Participants (n = 46,144) were followed for cause of death until December 2022 via national vital statistics (12,598 deaths; linkage rate: 98.4%). Ethical approval was obtained from the JAGES Ethics Review Board (Approval No.: 2025-02). Social disconnection was assessed through seven indicators including eating alone, lack of instrumental/emotional support, no participation in community activities, and no contact with friends. Incidence rates were calculated using person-years. Cox proportional hazards models were adjusted for sex, age, education, marital status, household composition, equivalent income, and depressive symptoms (GDS score ≥5).

**Results :** During an average follow-up of 12 years, 70 suicide deaths were recorded, corresponding to an annual suicide rate of 16.69 per 100,000—slightly lower than the official prefectural statistics (23.84). Eating alone was strongly associated with suicide risk: hazard ratios were 3.67 (95% CI: 1.39–9.70) at 2 years, 2.77 (95% CI: 1.21–6.35) at 4 years, 2.28 (95% CI: 1.09–4.75) at 8 years, and 1.92 (95% CI: 1.00–3.68) at 12 years. Adjustment for depressive symptoms did not substantially alter these associations. Individuals exhibiting multiple indicators of social disconnection had elevated suicide risk, particularly within the early years of follow-up.

**Conclusion :** Social disconnection was associated with an increased short-term risk of suicide, especially eating alone and lack of emotional support. These factors may serve as practical indicators for early suicide prevention strategies among older adults.

# Handgrip Strength Trajectories with Cognitive Function, Depression in Middle and Older Korean Adults

**Hee Joo Jung** (1)
Jeong Min Yang (2), Seo Yun Lee (1), Ye Woon Shin (1), You Bin Maeng (1), Ji Eun Hwang (3)

1 : Department of Public Health, General Graduate School of Dankook University, Cheonan, Republic of Korea
2 : Institute of Health and Environment, Seoul National University, Seoul, Republic of Korea
3 : Department of Health Administration, College of Health Science, Dankook University, Cheonan, Republic of Korea

**Introduction :** Handgrip strength(HGS) is a physical function indicator that declines with aging and is associated with cognitive decline and depression.This study identified the longitudinal trajectories of HGS among middle-aged and older adults in Korea and analyzed their associations with cognitive function and depression by sex and age.

**Methods :** This study utilized data from the Korean Longitudinal Study of Aging (KLoSA) from 2006 to 2020, with a final analytic sample of 6,417 participants after excluding missing values. First, handgrip strength trajectories by sex were identified using a group-based trajectory model for the period 2006–2014. Subsequently, from 2014 to 2020, the associations between the identified sex-specific trajectories and MMSE and CES-D scores were analyzed using generalized estimating equations(GEE).

**Results :** Five trajectory groups were identified for both men and women. Cognitive function(K-MMSE) was significantly lower in the Low and Mid-low HGS groups for both sexes, while depressive scores(CES-D) were higher in the same groups. In the age-stratified analysis, among men under 65 years, the Low HGS group had the lowest K-MMSE($p=0.004$). In men aged 65 years and older, lower HGS was simultaneously associated with cognitive decline($p<0.05$) and an increased risk of depression($p<0.05$). Among women under 65 years, K-MMSE were lower in the Mid-low HGS group($p=0.005$). In women aged 65 years and older, cognitive decline($p=0.005$) and an increased risk of depression($p=0.045$) were observed in the Mid-low HGS group, while more pronounced cognitive decline($p<0.001$) and a higher risk of depression($p<0.001$) were found in the Low HGS group.

**Conclusion :** Handgrip strength declines from midlife and is significantly associated with cognitive decline and a higher risk of depression. Measuring handgrip strength may be an effective tool for the early identification of at-risk middle-aged and older adults.

# Suboptimal gestational weight gain and diabetic biomarkers among Bangladeshi adolescent offspring

**Urme Binte Sayeed** (1)
Rubhana Raqib (1), Yukiko Wagatsuma (1)

1 : Doctoral student in Medical Sciences, Department of Clinical Trials and Clinical Epidemiology, Graduate School of Comprehensive Human Sciences, University of Tsukuba

**Background** : Maternal nutritional status and adequate gestational weight gain (GWG) are essential for ensuring the offspring's health. Exposure to an adverse intrauterine environment may disrupt fetal organ development, leading to cardiometabolic disorders later in life.

**Objective** : This study aimed to identify the association between suboptimal maternal GWG and diabetic biomarkers in Bangladeshi adolescents.

**Methodology** : This prospective cohort study was nested within a population-based food and maternal micronutrient supplementation trial conducted in Matlab, Bangladesh. Pregnancy was confirmed by ultrasound before gestational weeks 13 (GW), and later participants were invited to attend antenatal assessments at 14, 19, and 30 GW. GWG was calculated by subtracting the baseline maternal weight from the weight measured at GW 19 and 30. Afterwards, GWG was standardized by each GW to generate z-scores. A total of 502 offspring were followed up to 15 years of age. Diabetic biomarkers: fasting blood glucose (FBG), glycated hemoglobin (HbA1c) and triglyceride-glucose (TyG) index, were measured using whole blood and plasma samples. Associations between GWG at 19 and 30 GW and diabetic biomarkers were assessed using a multivariable linear regression (generalized linear model).

**Results** : A one–standard deviation decrease in GWG at 19 GW was significantly associated with higher FBG ($p = 0.005$) and TyG levels ($p = 0.041$) in adolescents. Standardized GWG at 30 GW showed no associations with diabetic biomarkers. Moreover, GWG at either 19 or 30 GW was not linked to HbA1c in adolescent offspring.

**Discussion and Conclusion** : Suboptimal maternal weight gain during mid-pregnancy was associated with elevated diabetic biomarkers among Bangladeshi adolescents. Adequate maternal nutrition during pregnancy is crucial for maintaining the health of the offspring.

# Trends in area-based socioeconomic inequalities in cancer mortality in Japan, 1995–2022

**Aoi Kataoka** (1,4)
Keisuke Fukui (2), Tomoki Nakaya (3), Yuri Ito (4)

1 : Department of Molecular Epidemiology, Future Medical Science, Kobe University Graduate School of Medicine
2 : Faculty of Societal Safety Sciences, Kansai University
3 : Graduate School of Environmental Studies, Tohoku University
4 : Department of Medical Statistics, Faculty of Medicine, Osaka Medical and Pharmaceutical University

**Backgrounds :** Cancer inequalities are globally monitored using social determinants of health (SDH) such as deprivation index, occupation, and education. In Japan, cancer inequality monitoring has mainly focused on regional differences, with limited SDH perspective. This study aimed to estimate trends in area-based socioeconomic inequalities of cancer mortality rate from 1995 to 2022.

**Methods :** Population and cancer death data by sex and age group from 1995 to 2022 were obtained from Population Census and Vital Statistics for 1,829 municipalities. Areal deprivation index (ADI) for each census year was used as an area-based socioeconomic status (SES). Poisson regression was conducted for each period (1995–99, 2000–04, 2005–09, 2010–14, 2015–19, and 2020–22) to estimate Slope Index of Inequality (SII) and Relative Index of Inequality (RII) of ADI for age-standardized mortality rates under 75 by sex, period, and cancer type (all sites, stomach, colorectum, liver, lung, pancreas, breast, and cervix).

**Results :** Both SII and RII increased among men for stomach (SII: 0.57 in 1995-99 and 2.79 in 2020-22; RII: 1.02 and 1.34), colorectum (SII: 0.36 and 3.41; RII: 1.02 and 1.31), and pancreas (SII: 0.56 and 1.18; RII: 1.07 and 1.14), and among women for stomach (SII: –0.72 and 0.99; RII: 0.94 and 1.29), colorectum (SII: –0.20 and 1.33; RII: 0.98 and 1.20), and breast (SII: –0.93 and 0.55; RII: 0.91 and 1.06). Breast cancer had a higher mortality rate in high SES areas until 2014, but from 2015 onwards, it became higher in low SES areas.

**Conclusion :** Widening area-based socioeconomic inequalities in cancer mortality rate especially in stomach, colorectum, pancreas, and breast were observed in both sexes. Deprived areas with high cancer mortality rate remain in Japan, where people may be left behind in cancer control. To ensure no one behind in the cancer control activities, it is necessary to strengthen prevention and treatment measures targeting these areas.

# Elevated risk of severe COVID-19 outcomes among underweight patients in Japan

**Yumi Matsushita** (1)
Tetsuji Yokoyama (2), Kayoko Hayakawa (3,4), Sho Saito (3,4), Nobuaki Matsunaga (4), Mari Terada (3,5), Setsuko Suzuki (3)
Shinichiro Morioka (3,4), Satoshi Kutsuna (3), Hisao Hara (6), Toshiki Ago (7), Akio Kimura (8), Norio Ohmagari (3,4)

1 : Office of Clinical Research and Education Promotion, Department of Clinical Research Management, Center for Clinical Sciences, Japan
2 : Department of Health Promotion, National Institute of Public Health
3 : Disease Control and Prevention Center, National Center for Global Health and Medicine, Japan Institute for Health Security
4 : AMR Clinical Reference Center, National Center for Global Health and Medicine, Japan Institute for Health Security
5 : Center for Clinical Sciences, Japan Institute for Health Security
6 : Department of Cardiology, National Center for Global Health and Medicine, Japan Institute for Health Security
7 : Division of Clinical Research and Education, Japan Institute for Health Security
8 : Department of Emergency Medicine and Intensive Care Unit, National Center for Global Health and Medicine, Japan Institute for Health Security

Numerous studies have examined possible associations between body mass index (BMI) and COVID-19 severity, hospitalization, and death. In Europe and the US, the number of thin people (BMI < 18.5) is quite low, so there have also been only limited studies on the severity of COVID-19 and death in underweight individuals. To the best of our knowledge, no studies have analyzed the severity of COVID-19 among underweight individuals by variant. In Japan, the prevalence of people with BMI < 18.5 is higher.

Therefore, we conducted the present study to evaluate associations between being underweight and COVID-19 severity and death by sex and age, by SARS-CoV-2 variant (omicron or not), and by the four categories of underweight, lower normal weight, normal weight, and overweight/obesity using a large-scale data registry of hospitalized COVID-19 patients in Japan (COVIREGI-JP), involving 46,291 Japanese patients ages 20-89 years. Severity was classified by the most intensive treatment received during whole through the hospitalization. Multiple logistic models were used to assess the risk of severe disease, and adjusted odds ratios (ORs) for BMI < 18.5, 18.5-20, and ≥ 25 relative to BMI of 20.1-24.9 were calculated by sex and age group. The risk of COVID-19 severity and death is significantly increased in underweight individuals with a BMI <18.5, especially for younger people.

The risk remained elevated even during the Omicron period, when general severity was declining. Comparing the period when the omicron variant predominated to when other variants were prevalent revealed a slightly different trend; it should be noted that in the omicron period, there was no significantly increased risk of COVID-19 severity and death among overweight individuals.

Prevention and treatment of COVID-19 has been a priority for overweight and elderly people. Underweight people should also be prioritized regardless of age in the future.