Japan Postcode-level walkability index and adult's walking time in 95 cities by exercise preference

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Background : Environmental and psychological factors are both important correlates of physical activity. However, few studies have examined the potential role of built environments in physical activity among those with psychological barriers.

Objective : We examined dose-response relations between the Japan Postcode-level Walkability Index (JPWI) and walking time among adults stratified by exercise preference.

Methods : This nationwide cross-sectional study included 40,286 Japanese adults (male 50.5%, 49.4±15.6 years) residing in 95 Japanese cities who responded to a web-based survey with quota sampling in 2021. We used publicly available data of JPWI, which is a composite indicator of population density, number of facility types (land use mix), and intersection density (mean 0.00±0.94, range -1.85 to 2.50). Weekly walking time was assessed by questionnaire. Restricted cubic splines modeled nonlinear relations between JPWI and walking time. Threshold effect analyses estimated the inflection points and the pre-/post-inflection slopes, with 95% confidence intervals (CIs) by exercise preference.

Results : 45.2% of participants did not prefer exercise. Median total walking time was 180 (65, 350) mins/week for those who liked exercise and 100 (25, 230) mins/week for those who disliked it. JPWI related positively and nonlinearly to walking time in both groups. Among individuals who liked exercise, the estimated inflection point was 0.61 (95% CI: 0.47, 0.75), and pre-/post-inflection slopes were 14.0 (-4.8, 32.8) and 113.4 (99.2, 127.6), respectively. Among those who disliked exercise, it was 0.86 (0.74, 0.97), with slopes 16.0 (4.3, 27.8) and 109.7 (92.0, 127.3), respectively.

Conclusion : Although the threshold of JPWI for increased walking time was slightly higher among those who disliked exercise, higher walkability was associated with longer walking times even among individuals with psychosocial obstacles, such as a dislike for exercise.

Overview of the Nationwide Surveillance System for Prion Diseases in Japan, 1999–2025

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Background : In Japan, nationwide surveillance and registration of prion diseases have been conducted by the Prion Disease Surveillance Committee, with the support of the Japanese Ministry of Health, Labour and Welfare, since 1999.

Aim: To provide an overview and update of the descriptive epidemiology of prion diseases in Japan, based on data from the nationwide surveillance registry.

Methods : The Prion Disease Surveillance Committee collects information on patients suspected of having prion diseases nationwide. All reported cases are investigated by committee members, and biannual meetings are held to confirm each diagnosis. Cases diagnosed with prion disease are registered in the surveillance registry and followed until death. Data were analyzed up to February 2025.

Results : A total of 10,453 cases were reported from April 1999 through February 2025, of which 7,923 were reviewed by the committee. Among these, 5,432 cases were diagnosed with prion diseases and registered in the surveillance system. By disease type, there were 4,101 cases of sporadic Creutzfeldt-Jakob disease (CJD) (75.5%), 1,012 of genetic CJD (18.6%), 194 of Gerstmann-Sträussler-Scheinker disease (GSS) (3.6%), 94 of acquired CJD associated with dura mater grafts (1.7%), 9 of fatal familial insomnia (FFI) (0.2%), 1 of acquired CJD unrelated to dura mater, 1 of variant CJD, and 20 unclassified prion diseases (0.4%). The largest number of registered patients was 303 in 2014, when the overall incidence rate of prion diseases was 2.4 per million person-years. By age group, the incidence rate was 0.1 for ages 30–39, 0.5 for 40–49, 2.1 for 50–59, 4.7 for 60–69, 8.2 for 70–79, and 6.1 for those aged 80 years and older.

Conclusion : The number of registered patients may have been increasing since 2014, as case registration often requires several years from disease onset. Continuous surveillance is essential to clarify the epidemiology of prion diseases in Japan.

Hypertension Awareness, Treatment, Control and Cardiovascular Outcomes: Aichi Workers' Cohort Study

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Background : Hypertension is a major modifiable risk factor for cardiovascular disease (CVD), yet awareness, treatment, and control (ATC) remain suboptimal. Evidence on how ATC affects long-term CVD risk among Japanese workers is limited.

Objective : To examine associations of hypertension ATC status with CVD incidence and describe temporal trends over two decades.

Methods : We analyzed 4,703 participants (aged 35–66) in the Aichi Workers' Cohort Study (baseline 2002, follow-up 2021). Hypertension was defined as systolic blood pressure (SBP) ≥140 mmHg, diastolic (DBP) ≥90 mmHg, or medication use. Awareness was a "yes" to "have you ever been told you have hypertension," treatment was medication use, and control was SBP/DBP <140/90 mmHg. Unaware were hypertensives not told of hypertension, untreated those not using medication, and uncontrolled those treated with SBP/DBP ≥140/90 mmHg. CVD events (stroke, coronary heart disease) were verified from multiple sources. Cox models estimated hazard ratios (HRs) and 95% confidence intervals (CIs) for awareness, treatment and control using unaware, untreated, and uncontrolled hypertensives as reference, adjusting for demographic, lifestyle, and clinical factors.

Results : At baseline, 1,329 participants (28.3%) had hypertension; 58.5% were aware, 25.9% treated, and 8.5% were controlled. Over 19.3 years median follow-up, 85 CVD events occurred among hypertensives. Adjusted HRs were 1.15 (95% CI: 0.68–1.94) for awareness, 1.14 (0.68–1.92) for treatment, and 1.50 (0.77–3.12) for control. From 2002 to 2023 (ages 40–59), prevalence fell (30.0% to 24.3%), awareness declined (58.0% to 50.5%), treatment nearly doubled (26.0% to 52.5%), and control improved (8.7% to 35.4%).

Conclusion : Hypertension ATC status was not significantly associated with CVD outcomes, but improvements in treatment and control indicate progress, while declining awareness highlights the need for early detection and prevention among Japanese workers.

Are Dust-induced Lung Problems Genetically Tied to Autoimmune Diseases? Evidence from Mendelian Randomization

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Background : Occupational and environmental dust exposure is increasingly recognized as a significant risk factor for respiratory diseases, potentially influencing systemic inflammation and autoimmunity. However, causal evidence linking chronic dust exposure to autoimmune diseases (AIDs) remains unclear.

Methods : We conducted a two-sample Mendelian randomization (MR) study utilizing genetic variants associated with lung diseases due to external agents as proxies for chronic dust exposure. Exposure data were sourced from the FinnGen consortium (n=500,348), and outcome data for various AIDs were obtained from the UK Biobank (n=53,831). MR analyses included inverse variance weighting (IVW), MR-Egger, and weighted median methods, complemented by sensitivity analyses to evaluate pleiotropy and heterogeneity.

Results : Genetically predicted susceptibility to dust-related lung diseases was generally not significantly associated with most autoimmune diseases assessed. However, consistent and significant associations were observed with ankylosing spondylitis (AS), yielding odds ratios of 1.39 (95% CI: 1.05-1.84), 1.59 (95% CI: 1.09-2.34), and 1.54 (95% CI: 1.03-2.28) in IVW, MR-Egger, and weighted median analyses, respectively. Sensitivity analyses supported the robustness of this finding.

Conclusions : This MR analysis provides genetic evidence supporting a causal link between susceptibility to dust-induced lung diseases and an increased risk of ankylosing spondylitis. These results highlight the potential role of environmental and occupational dust exposure in autoimmune pathogenesis, particularly in AS, and underscore the importance of preventive measures for dust-exposed populations.

Preeclampsia prediction with polygenic risk scores: the TMM BirThree Cohort Study

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Hypertension in pregnancy is influenced by genetic and environmental factors. Genomic information from both pregnant women and their partners (the paternal parent of their fetuses) may be effective biomarkers for preeclampsia (PE), a pregnancy-specific hypertensive disorder characterized by new-onset hypertension and organ dysfunction after 20 weeks of gestation. This study investigated the association of pregnant women and their partners' polygenic risk scores (PRSs) for systolic and diastolic blood pressure (SBP and DBP) and PE with PE onset. This study also evaluated predictive performances of PRSs with clinical predictive variables. Pregnant women and their partners in the Tohoku Medical Megabank Project Birth and Three-Generation Cohort Study were genotyped using either Affymetrix Axiom Japonica Array v2 (further divided into two cohorts: the PRS training cohort and the internal-validation cohort at a ratio of 1:2) or Japonica Array NEO (external-validation cohort). PRSs were calculated for SBP, DBP, and PE and hyperparameters for PRS calculation were optimized in the training cohort. The final study sample comprised 3,384 in the PRS training cohort, 6,768 in the internal validation cohort, and 9,684 in the external validation cohort. In the internal and external validation cohorts, 3,673 (54.3%) and 2,616 (27.0%) had their partners' genotyping data. Maternal SBP-, DBP-, and PE-PRSs were associated with PE onset in both validation cohorts, while paternal SBP- and DBP-PRSs were associated with PE onset only in the external-validation cohort. Maternal DBP-PRS calculated using "LDpred2" presented the most improvement in prediction models and provided additional predictive information on clinical predictive variables. Paternal DBP-PRS improved prediction models in the internal-validation cohort. These results indicate that both pregnant women and their partners' PRSs, along with clinical predictive variables, may be useful predictive biomarkers for PE.