Association between Family History of Chronic Diseases and Major Chronic Disease Diagnosis

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Background : Chronic diseases require long-term management due to genetic and environmental interactions. Family history, as an irreversible risk factor, increases disease risk but may also guide prevention. This study examined associations between family history and major chronic conditions in Korean adults.

Methods : Data from 9,300 adults in the 9th Korea National Health and Nutrition Examination Survey (2022–2023) were analyzed. Outcomes were hypertension, diabetes, dyslipidemia, atopic dermatitis, and allergic rhinitis. Family history was the predictor, with adjustment for sex, age, income, education, marital status, economic activity, subjective health, smoking, and alcohol as covariates. Complex-sample chi-square tests and logistic regression were conducted using SAS 9.4, with $p<.05$ considered significant.

Results : Overall, 67.4% reported a family history. Prevalence was hypertension 23.2%, dyslipidemia 21.7%, allergic rhinitis 19.0%, diabetes 9.3%, and atopic dermatitis 4.7%. Those with family history had higher prevalence of hypertension (30.7%, $p<.0001$), diabetes (12.2%, $p<.0001$), and dyslipidemia (29.8%, $p<.0001$). Regression showed lower odds without family history: hypertension OR=0.43 ($p<.0001$), diabetes OR=0.56 ($p<.0001$), dyslipidemia OR=0.45 ($p<.0001$). Adults aged 19–39 had the lowest odds of hypertension (OR=0.04, $p<.0001$) but the highest of atopic dermatitis (OR=4.59, $p<.0001$). No significant associations were found for allergic diseases.

Conclusion : Family history is a nonmodifiable risk factor for chronic diseases, reflecting genetic–lifestyle interactions. The lack of association with allergic diseases suggests stronger environmental effects. Standardized family history assessments in primary care are needed to identify high-risk groups and to prioritize lifestyle modification, screening, and tailored management. Further studies should examine gene–environment interactions for disease-specific prevention strategies.

Concurrent conditions criteria for older people and incident functional disability: Japanese cohort

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Background : Japan's program “Integrated Implementation of Health Promotion Programs and Care Prevention for the Older” emphasizes the need to consider disease and frailty jointly, as older adults often have concurrent health conditions. This study examined the association between concurrent conditions criteria based on this program and incident functional disability in Japanese older adults.

Methods : Cohort data from two prefectures (2020–2023) were used; 349,442 persons (≥75 y) were included. The exposure was combinations of eight program criteria; “malnutrition”, “oral health”, “multiple medications”, “sleeping pills & history of falls/cognitive function”, “physical frailty”, “poorly controlled diabetes/hypertension”, “underlying chronic diseases & frailty”, “poor renal function, not receiving treatment”. The outcome was incident functional disability under the Long-Term Care Insurance System. Cox models were used, adjusted for sex and age.

Results : Among 349,442 persons, 128 patterns of criteria combinations were identified, with 14.7% developing incident functional disability. A greater number of concurrent conditions criteria met was associated with higher risk of functional disability (p-trend <0.05). Compared with none, 112 patterns had hazard ratios (HRs; point estimations) >1, of which 87 were statistically significant ($p<0.05$). The top 10 HRs (96.1–11.7) corresponded to patterns meeting ≥2 criteria, the highest (HR=96.1) being “malnutrition + multiple medications + physical frailty + poorly controlled diabetes/hypertension”. However, each of these top 10 patterns included <10 persons. When restricted to patterns with ≥70 persons, the top 10 HRs involved ≥3 criteria, all significantly associated with incident functional disability ($p<0.05$).

Conclusion : Older adults with complex combinations of concurrent conditions had higher risk of functional disability, although these combinations were relatively uncommon.

Cross-cohort proteomic profiling of LDL/HDL ratio and nutrients: UKB and YMoC study

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Background : The LDL/HDL ratio (LHR) has recently attracted attention as an indicator of atherosclerotic and thrombotic risk. Despite their importance, proteomic studies on lipid metabolism and its dietary modification remain scarce.

Methods : The discovery analysis was performed in the UK Biobank (UKB), and the replication analysis in the Yamanashi Multi-Omics Cohort (YMoC). In the UKB (n = 31257, mean age 55.8 ± 8.2 years, 57.3% female), we conducted linear regression to identify proteins associated with the LHR, adjusting for age, sex, body mass index, smoking, alcohol, physical activity, and lipid-lowering drugs use. The false discovery rate (FDR) was controlled at $q < 0.05$ using the Benjamini–Hochberg procedure. Proteins were considered replicated if they showed significant associations in the same direction in YMoC (n = 162, mean age 54.2 ± 7.3 years, 40.1% female). The association between the replicated proteins and energy-adjusted nutrient intake estimated from a food frequency questionnaire was evaluated using partial Spearman correlation (FDR $q < 0.1$), adjusting for age, sex, smoking, exercise, income, and lipid-lowering drugs use.

Results : Of the 2,919 proteins assayed, seven were identified as showing significant associations in both the UKB and YMoC. Among the identified proteins, 17 nutrient–protein pairs were significant ($q < 0.1$). Ethanol intake correlated with three proteins related to lipid metabolism and inflammation (e.g., SSC4D: $r = -0.33$, $q < 0.001$). In addition to lipids and saturated fatty acids, fat-soluble vitamins such as retinol equivalents and vitamin D were also linked to four proteins (e.g., retinol-NPPB: $r = -0.21$, $q = 0.077$).

Conclusion : This study identified LHR-associated proteins and their dietary correlations, particularly with ethanol and lipid intake. Further research is needed to validate causal relationships and to inform personalized dietary strategies to reduce atherosclerotic and thrombotic risk.

Spatiotemporal patterns of dengue transmission in Taiwan, 1998–2024

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Background : Dengue fever is a public health threat to Taiwan, with pronounced spatio temporal heterogeneities, while it has a very unique character of having endemic and non-endemic areas on its small land. To understand the spatiotemporal patterns of transmission, the present study aimed to estimate the effective reproduction number (R) over time and geographic region.

Methods : The incidence of confirmed dengue cases, classified into local and imported cases, were retrieved from the surveillance data and aggregated into a monthly series from 1998 to 2024. The effective reproduction number in each month m, R_m was estimated via a maximum likelihood approach. Analyses covered southern Taiwan (Kaohsiung, Tainan, Pingtung), northern Taiwan (Taipei, New Taipei, Taoyuan), and central and eastern regions.

Results : Our preliminary analysis revealed a strong regional difference: southern Taiwan frequently having $R_m > 1$,while northern Taiwan having mostly $R_m < 1$ despite frequent imported cases. Long-term trends revealed periodic patterns with a gradually increasing Rm up to a large epidemic involving Tainan in 2014.

Discussion : Our analysis highlighted a distinct patter between south and north regions, perhaps attributable to different vector ecology. Temporal fluctuations indicate particular months at risk of having local outbreaks even in northern regions. No clear indication of climate change was identified over the course of entire period from 1998-2024.

Impact of Health Japan 21 blood pressure and cholesterol goals on stroke and heart disease by 2040

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Introduction : Few studies projected the long-term impact of primary prevention policies on cardiovascular disease (CVD) outcomes, and none for Healthy Japan 21 beyond its third phase. This study aimed to estimate projected long-term national impact of achieving the systolic blood pressure (SBP) and low-density lipoprotein cholesterol (LDL-C) targets of Healthy Japan 21 (third phase) on stroke and coronary heart disease (CHD) incidence and all-cause death by 2040.

Methods : We conducted a microsimulation with counterfactual analysis by $IMPACT_{NCD\text{-}JPN}$, a validated individual-based dynamic model based on real-world data. A synthetic Japanese population (ages 30–99) was simulated from 2001 to 2040 with life-course data on seven CVD risk factors to estimate incidence and mortality. The base-case scenario reflected observed trends, while counterfactuals assumed achievement of Healthy Japan 21 targets: (i) a 5 mmHg reduction in mean SBP between 2024–2032, the baseline and target years of Health Japan 21 third phase, and (ii) a 25% reduction in the proportion with LDL-C ≥160 mg/dl between 2024–2032. Outcomes were national stroke and CHD incidence and all-cause death.

Results : Between 2024–2032, SBP (men/women) was projected to fall from 131/128 mmHg to 129/125 and LDL-C from 111/116 mg/dL to 110/115 in the base case. In the counterfactual (Healthy Japan 21 target) from 2024–2032, SBP fell 5 mmHg and LDL-C ≥160 mg/dL prevalence dropped 25%. Compared with the base case, meeting the targets was projected to prevent or delay 170,000 (95% UI: 120,000–250,000) and 120,000 (75,000–180,000) stroke and CHD cases, and 100,000 (73,000–160,000) and 96,000 (70,000–140,000) deaths between 2024–2040 cumulatively, for men and women, respectively.

Discussion : Healthy Japan 21 (third phase) plans to evaluate progress of its CVD measures partly by changes in SBP and LDL-C in 2034, but our model estimated the projected national impact on stroke and CHD cases and deaths by 2040.