Effect of ambient temperature on pediatric intestinal intussusception incidence in Seoul, Korea

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Background : Pediatric intussusception has been linked to seasonality and ambient temperature, but few studies have examined its short-term temperature dependence at a daily resolution.

Objective : This study investigated the association between daily ambient temperature and the incidence of pediatric intestinal intussusception.

Methods : Claims data from the National Health Insurance Service were analyzed for pediatric patients (≤10 years old) who underwent procedural or surgical treatment for intussusception in Seoul from 2009 to 2019. Daily average temperature data were obtained from the Korea Meteorological Administration. Seasonal case counts were compared, time-series trends were visualized using a spline function, and a distributed lag non-linear model (DLNM) was applied to assess rate ratios (RRs) while accounting for cumulative lag and non-linearity. Analyses were conducted separately for total, complicated, and uncomplicated cases.

Results : Total intussusception case counts peaked in summer, followed by autumn, spring, and winter. The DLNM model with a 0–3-day lag showed a significant RR increase for total and uncomplicated intussusception at temperatures around 7° C to 20° C compared to 0° C. Complicated intussusception exhibited an increase from subzero temperatures to approximately 4° C, though confidence intervals were wider due to lower case counts. No significant risk change was observed at temperatures above 20° C in any group.

Significance : This study demonstrated a significant association between daily ambient temperature and pediatric intestinal intussusception, with short-term (3-day) cumulative effects suggesting that temperature fluctuations may influence disease incidence.

Effect of Short-Term Air Pollution Mixtures on Acute Exacerbations of COPD : A Case-Crossover Study

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Environmental exposures are increasingly recognized as important contributors to acute exacerbations of chronic obstructive pulmonary disease (AECOPD). This study aimed to evaluate the impact of short-term exposure to mixtures of multiple ambient air pollutants on the risk of AECOPD. We linked the Korea National Health Insurance Service sample cohort (2006–2019) with air pollution data. Hospitalization dates for AECOPD among patients aged 40 years or older were defined as case days, and control days were selected within the same year, season, and weekday using a time-stratified case-crossover design. The final analysis included 4,744 case days and 19,213 control days. Exposures were defined as daily mean concentrations of $PM_{2.5}$, PM_{10}, NO_2, SO_2, CO, and O_3. Both single-day lags (lag0–7) and cumulative lags (lag0–1 to lag0–7) were assessed. Mixture effects were estimated using quantile g-computation models, adjusting for temperature, relative humidity, wind speed, metropolitan region, and holidays. This approach allowed evaluation of the effects of complex pollutant mixtures while accounting for meteorological factors. In the single-day lag analysis, the risk of AECOPD significantly increased at lag1 (OR=1.07, 95% CI: 1.01–1.13), lag2 (OR=1.09, 95% CI: 1.03–1.16), lag3 (OR=1.06, 95% CI: 1.01–1.13), lag6 (OR=1.08, 95% CI: 1.01–1.13), and lag7 (OR=1.05, 95% CI: 1.02–1.15). In the cumulative lag analysis, consistent risk increases were observed across all periods from lag0–1 to lag0–7, with ORs ranging from 1.07 to 1.10 (all $p<0.05$). This study found that short-term exposure to mixtures of ambient air pollutants significantly increases the risk of hospitalization for AECOPD. These findings provide evidence that air pollution plays an important role in the occurrence of AECOPD and underscore the need for public health interventions to reduce exposure, particularly among vulnerable populations.

Loneliness and related factors in child-rearing individuals: National survey data, Japan, 2022–2023

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Aim : Stay-at-home mothers have been recognized as a high-risk group for loneliness. This study aimed to clarify the status of loneliness and its associated factors in child-rearing individuals by analyzing nationwide survey data from Japan.

Method : The survey targeted 40,000 individuals aged ≥16 years in 2022 and 2023, randomly sampled from the national resident registry. Child-rearing individuals were categorized into single-parent households, households with parents and children, and three-generation households. Loneliness was measured by direct question and the UCLA Loneliness Scale Short Form (UCLA). The independence of categorical variables was analyzed by the χ 2-test, and factors associated with loneliness were explored by linear regression analysis.

Results : There were 11,219 valid responses to the 2022 survey (valid response rate: 56.1%) and 11,142 to the 2023 survey (55.7%). Among the respondents, 5,360 were raising children. Single-parent households had significantly higher shares unemployed, non-regularly employed, and earning <2 million yen compared with other households. Health status was significantly worse in single-parent households than in other households. Levels of life satisfaction were significantly lower in single-parent households than in other households. Of the three household types, single-parent households had the highest share of respondents who reported feeling occasionally to frequently lonely and the highest mean UCLA score (both significant). In linear regression, the direct question about loneliness and UCLA score were significantly associated with educational attainment, income, life satisfaction, and current health status. Additionally, the direct question was associated with household composition.

Conclusion : Single-parent households were more economically disadvantaged and had poorer health than other households. Furthermore, linear regression analysis revealed that single-parent households experienced stronger feelings of loneliness, even after adjusting for other factors. These findings show the need to strengthen consultation support systems, including employment support, while paying particular attention to single parents' strong feelings of loneliness and their health status.

Coexistence of overweight and micronutrient deficiencies among reproductive-aged women in Bangladesh

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Background : Overweight and obesity are rising rapidly among women of reproductive age (WRA) in Bangladesh, while micronutrient deficiencies remain widespread. However, evidence on their coexistence—the double burden of malnutrition—is limited, despite its potential implications for maternal and child health.

Objective : This study aimed to estimate the prevalence and determinants of concurrent overweight and micronutrient deficiencies among WRA in Bangladesh.

Methods : We analyzed data from 1,110 WRA aged 15–49 years recruited from rural areas, urban slums, and a garment factory in Bangladesh. Overweight was defined as BMI ≥25 kg/m² for women aged ≥20 years and BMI-for-age Z-score ≥1 for those <20 years. Micronutrient deficiency was defined as either iron and/or zinc deficiency. Multinomial logistic regression was performed to examine associations of sociodemographic and dietary factors with overweight, micronutrient deficiency, and their coexistence.

Results : The mean (SD) age of the study participants was 30.2 (7.4) years. Overweight prevalence (32%) exceeded underweight (12%). The coexistence of overweight and micronutrient deficiencies was highest among women in urban slums (23%). In the multinomial logit model, age was positively associated with overweight (mOR: 1.08, 95% CI: 1.05–1.12), micronutrient deficiency (1.03, 1.003–1.06), and their coexistence (1.08, 1.04–1.11), compared with women who were neither overweight nor micronutrient deficient. Additionally, residence based on occupation indicating slum areas and garment factory, and inadequate dietary diversity significantly increased the risk of double burden of malnutrition.

Conclusions : This study highlights that socio-demographic and dietary factors play a crucial role in the coexistence of overweight and micronutrient deficiencies among WRA in Bangladesh. It addresses the need for interventions that improve lifestyle, diet quality, and weight management to combat this dual challenge.

Proposing a method to connect epidemic model with suicide causal model: Balancing the trade-offs

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Objective : The aim of the present study was to develop an epidemiological modelling approach to quantify and optimize epidemiological benefits of public health interventions against COVID-19 and the potential negative societal impact on suicides, aiming to minimize the volume of mortality.

Method : A quantitative causal inference model was developed to assess the impact of public health interventions on suicide, using health conditions (e.g., depression) and economic problems (e.g., unemployment) as mediating variables. Additionally, changes in the number of COVID-19-related deaths due to control measures were estimated using an age-sex-stratified compartmental model. Finally, a comparative analysis was carried out balancing between suicide deaths and COVID-19 deaths and identify theoretically optimal level of control.

Result : The mechanism underlying excess suicides was modeled using excess unemployment and a mood index of depression as explanatory factors. Excess unemployment was driven by the societal cost of epidemic control measures, while the mood index was influenced by the rate of change in the number of infections. Consequently, although stricter control measures helped reduce COVID-19-related mortality, they may also lead to an increase in the incidence of suicides.

Discussion : Model-based optimization further suggests that tightening the current control policies by 7% to 46% would yield the best overall outcome, minimizing total mortality.