

Hiroaki Onizuka¹, Naoki Nishimura², Kosuke Kiyohara³, Haruhisa Fukuda²

¹ School of Interdisciplinary Science and Innovation, Kyushu University, Fukuoka, Japan

² School of Medicine, Kyushu University, Fukuoka, Japan

³ Department of Food Science, Otsuma Women's University, Tokyo, Japan

Introduction

- *Streptococcus pneumoniae*, a gram-positive bacterium, is a major respiratory pathogen that can cause non-invasive pneumococcal diseases (non-IPDs).
- The susceptible age groups for *S. pneumoniae* infections (including invasive case) are children aged 5 years or less and older persons aged 65 years or more, and Japan carries out pneumococcal vaccination programs for these at-risk populations.
- If the risk of *S. pneumoniae* infections is found to be higher in persons with comorbidities, this information may be applied to optimize vaccination strategies to target these populations.

Methods

Data

- In this study, municipality-level information centered on claims data was used.
- Based on recorded diagnoses, we identified chronic medical conditions in each subject between April 2015 and March 2016, and examined the subsequent occurrence of pneumococcal disease from April 2016 onward.
- According to the chronic medical conditions defined by Imai (2018) such as Chronic heart disease, Chronic lung disease, Diabetes mellitus, Chronic liver disease, Asplenia, HIV infection, Alcoholism, Cancer, Chronic renal disease, Organ transplantation, Cerebrospinal fluid leakage.
- In addition, we added lung tuberculosis, dysthyroid, cochlear implant, smoking, down syndrome, nephrotic syndrome, nontuberculosis mycobacterial infection, aspiration pneumonia, chronic glomerulonephritis, cushing's syndrome, adrenocortical insufficiency, dyspituitarism, hashimoto disease, ulcerative colitis, crohn disease, biological drug, immunosuppressant, steroid and anti-cancer therapy.

Statistical Analysis

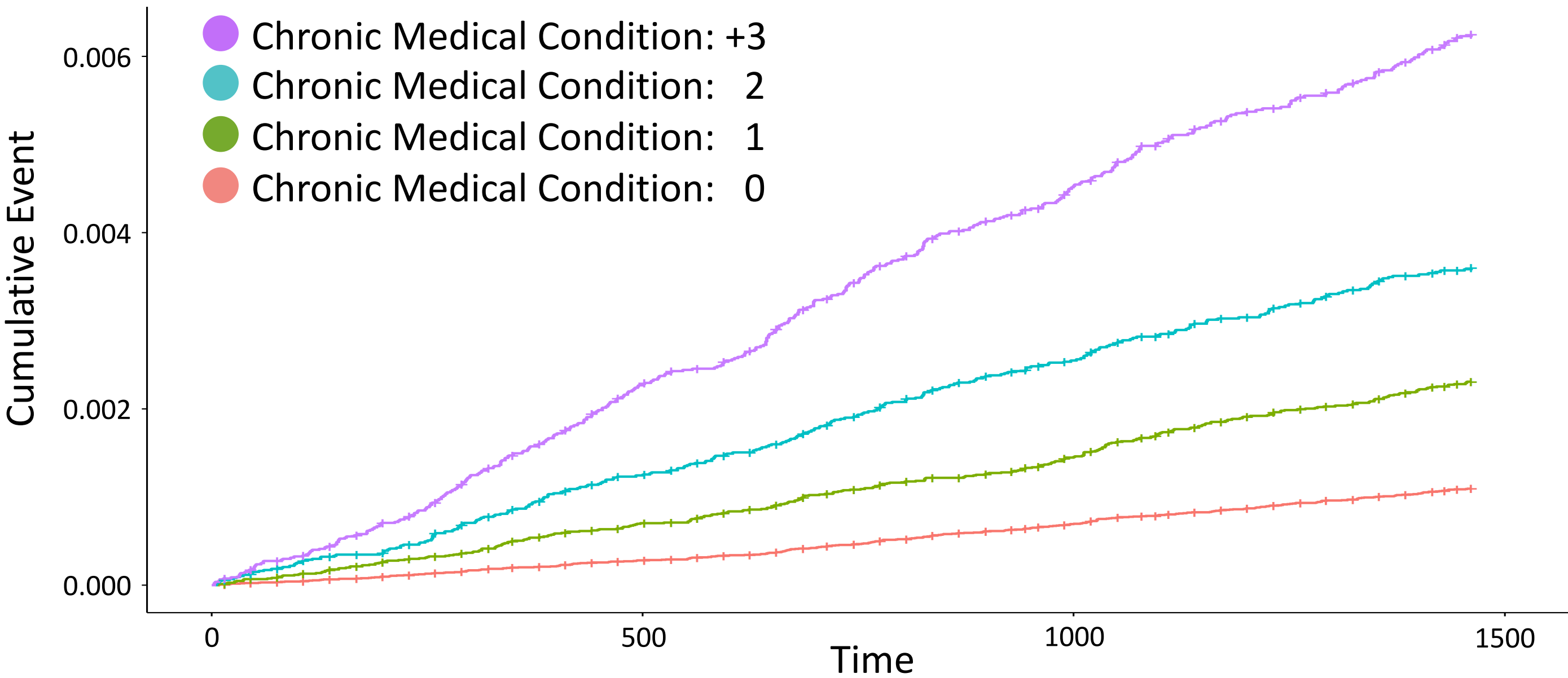
- Cox proportional hazards models were used to estimate the hazard ratio of each chronic medical condition for pneumococcal disease occurrence.

Statistical analyses were performed using R Statistical Software (version 4.1.1; R Foundation for Statistical Computing, Vienna, Austria). Two-tailed P values below 0.05 were considered significant.

Results

- This study was conducted on 732,235 subjects, of which 61,306 (8.4%) were aged 0-18 years, 184,367 (25.2%) were aged 19-49 years, 126,078 (17.2%) were aged 50-64 years, and 360,484 (49.2%) were aged ≥65 years.
- The total observation period spanned 2,724,028 person-years, during which 1,466 cases of pneumococcal disease occurred. The overall incidence rate was 53.8 per 100,000 person-years.

Figure 1. Cumulative Event by Chronic Medical Conditions



Conclusion

- Persons aged 50-64 years with multiple chronic medical conditions or with specific conditions are at higher risk of developing pneumococcal disease, indicating a need to consider their inclusion in routine vaccination programs.

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