

Supplemental Digital Content 4: Potential confounders

Age at index date: the number of days that had elapsed between the patient's birth date (as recorded in the National Health Index database) and the date of their first ever hospital-based diagnosis of community-acquired pneumonia or another lower respiratory tract infection.

Ethnicity: the patient's self-reported ethnicity as recorded in the National Health Index database. For patients who had more than one ethnicity recorded, *ethnicity* was based on a prioritization algorithm developed by Statistics New Zealand: Māori (highest priority), Pacific, Asian, Other, European, Missing (lowest priority).

Socioeconomic status: an area-level measure of social deprivation based on household information from the 2006 Census (Salmond et al., 2007). Quintile five denotes patients who were living in the most socioeconomically disadvantaged areas.

Pneumococcal conjugate vaccine exposure before the index date: the patient's pneumococcal conjugate vaccine exposure status, derived from the National Immunization Register (data available for patients born between 2006 and 2011 only: no = born in 2005 or no recorded complete dose if born between 1 January 2006 and 31 October 2011; yes = at least one recorded completed dose if born between 1 January 2006 and 31 October 2011; 'missing' = born from 1 November 2011).

Dispensings of non-topical antibiotics within 30 days before the index date: non-topical antibiotics, identified using chemical identification numbers recorded in the Pharmaceutical Collection, dispensed from a community pharmacy to the patient within 30 days before the index date (no = no recorded non-topical antibiotic dispensing within 30 days before the index date; yes = at least one recorded non-topical antibiotic dispensing within 30 days before the index date).

Hospital admissions for any diagnosis within 30 days before the index date: hospital admissions for any diagnosis (excluding non-problematic birth event) identified using International Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification Codes recorded in the National Minimum Dataset within 30 days before the index date (no = no recorded admissions within 30 days before the index date; yes = at least one recorded admission within 30 days before the index date).

Reference

SALMOND, C., CRAMPTON, P. & ATKINSON, J. 2007. *NZDep2006 Index of Deprivation*. Wellington: University of Otago.