

A Systematic Review on the Global Clinical Burden of Pneumonia among Adults Aged 50 and Older

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Objective

➤ To determine the global clinical burden of pneumonia among adults aged 50 and older.

Methods

- **Definition** Pneumonia is defined as an infection of the pulmonary parenchyma accompanied by the presence of clinical features of an acute infection (eg, cough, fever, sputum production, and chest pain), along with the presence of an acute infiltrate on chest radiograph.
- **Search Strategy** We exhaustively searched MEDLINE, EMBASE, Web of Science and Cochrane Library for target studies.
- **Eligibility Criteria** Primary observational studies were included, which published from January 2010 to December 2020 and reported original data to examine the disease burden of patients with bacterial pneumonia among adults aged 50 and older.
- **Selection Process** The detailed selection process is shown in Figure 1.
- **Data Collection** Data were extracted using a pre-designed spreadsheet, and descriptively summarized.
- **Bias Assessment** We use the Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies developed by the National Heart, Lung, and Blood Institute (NIH) to assess the quality of included observational studies.

Table 1 : Descriptive results of studies

	No. of studies ⁵	Range of Incidence (per 100,000 person-years)	Range of 30-day Case Fatality Ratio for inpatients (%)	Range of Mortality Rate (per 100,000 person-years)
Diseases				
CAP ¹	11	100.00-3130.00	1.20-43.15	0.17-10.80
Others ²	21	160.00-617.90	3.20-40.0	0.02-8.70
Countries				
Developed Countries ³	29	144.00-2741.00	1.20-43.15	0.17-10.80
Developing Countries ⁴	4	100.00-3130.00	5.00-12.60	NA

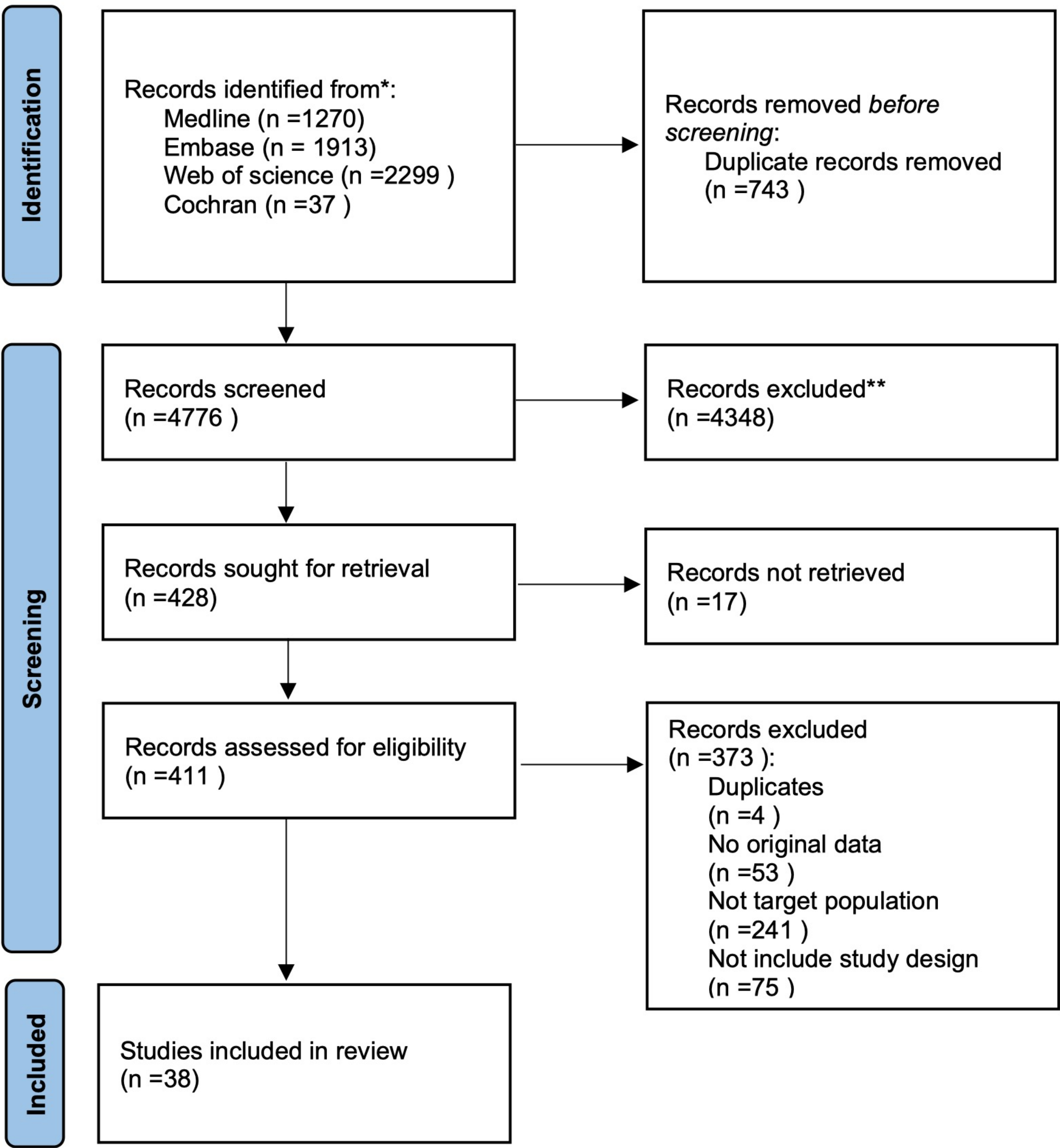


Figure 1: PRISMA 2020 flow diagram for the systematic review.

- 1 Community Acquired Pneumonia, CAP;
- 2 Pneumococcal Pneumonia; Postobstructive Pneumonia; Invasive Pneumococcal Disease, IPD; Nursing Home Acquired Pneumonia, NHAP.
- 3 Countries which have a HDI score above 0.8 Include Spain, UK, USA, Japan, France, Italy, Germany, South Korea, Switzerland, Canada.
- 4 Countries which have a HDI score below 0.8 Include Guatemala, China, Brazil, Poland.
- 5 Studies which only reported the etiology were be excluded form the table.

Results

- Thirty-eight studies were included from 5562 searched citations. Thirty-two of them reported evidence from developed countries while the other reported evidence from less developing regions. The included studies were mainly cohort studies and surveillance studies.
- Most of the included studies focused on CAP. The reported incidences of CAP varied from 100.00 to 3130.00 (per 100,000 person-years) and increased rapidly with age. The case fatality ratios (1.2% to 43.15%) and mortality rate (0.17% to 10.8%) for inpatients varied a lot across studies. (Details see Table 1)
- The most frequently reported pathogen was Streptococcus pneumoniae, with 3, 12F, 19A as the three most prevalent serotypes, which were covered by the 13-valent pneumococcal conjugate vaccine.

Conclusions

- Comparing with the findings of previous systematic reviews on pneumonia burden from 1990 to 2009 in European and North American adults, the clinical burden from 2010 to 2020 in global aged adults reported by our review did not change significantly, although immunization programs and treatment guidelines were widely recommended.
- Better understanding of pneumonia clinical burden in industrialized countries was established partially on the matured national surveillance systems. The scarcity of evidence from less industrialized regions hindered our understandings of their pneumonia clinical burdens.
- An increase of Pneumonia burden globally was expected given the aging population worldwide. In the future, potential interventions, for example expanding current immunization program, scaling up antimicrobial stewardship projects, and introducing next generation vaccines, need be considered to resolve the burden of Pneumonia in aged adults.



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