Search Strategy:

PubMed and Google Scholar were searched to identify studies from the United States (US), Canada, or Europe reporting the frequency of *S. pneumoniae* in adults with community-acquired pneumonia (CAP).

The following was entered as a PubMed search:

(pneumonia[title]) AND (etiolog\* OR aetiolog\* OR cause OR microbiolog\* OR “Streptococcus pneumoniae”[Mesh] OR bacteria OR culture\*) NOT (children OR infant\* OR pediatric\* OR randomized OR nosocomial[title] OR organizing[title] OR interstitial[title] OR healthcare[title] OR ventilator[title] OR Case Reports[ptyp])

This search returned 7633 articles. The titles/abstracts of these articles were reviewed and studies outside the US, Canada, or Europe were excluded, as were studies that met any of our exclusion criteria (see below).

The references of the articles meeting inclusion criteria were also considered for inclusion.

Inclusion criteria:

Inclusion required the following:

* Patients are community-dwellinga adults with clinical signs of respiratory infection and a pulmonary infiltrate on chest radiography
* Patients present to hospitals or clinics in either the US, Canada, or Europe
* At least 50 patients studied
* At least 1 valid pneumococcal testb (other than blood culture) is performed on > 50% of patientsc
* Sufficient information in study (including support materials) to calculate the proportion of patients with a positive valid pneumococcal test

a The term “community-acquired” was not consistently used to describe patients with CAP until the late 1970s. Pneumonia studies published prior to this time period were assumed to be reports of CAP unless the authors stated otherwise. Studies published after this time were required to indicated that pneumonia was acquired in the community.

b Valid pneumococcal tests include the following:

* *S. pneumoniae* cultured from any site other than the oral cavity or nasopharynx. Examples of acceptable specimens for culture include: blood, pleural fluid, transthoracic needle aspirate, biopsy or autopsy specimen, sputum (expectorated or induced), tracheal aspirate, bronchoalveolar lavage fluid or protected specimen brush
* Pneumococcal cell wall antigen detection in urine
* Polymerase chain reaction (PCR) testing on pleural fluid specimen
* Mouse inoculation

c For studies that reported data separately for the subset of patients who underwent microbiologic testing, we used this subgroup when determining the proportion of patients who underwent pneumococcal testing.

Note: the present analysis is focused on CAP studies in immunocompetent patients. Most studies excluded immunocompromsied patients. For studies that reported data separately for immunocompromised and immunocompetent patients, we analyzed the immunocompetent subgroup.

Exclusion criteria:

Studies were excluded for the following reasons:

* Study is a randomized controlled trial
* Study includes patients from regions outside the US, Canada, and Europe
* Study population overlaps with an already included study
* Study excludes patients with CAP of unknown etiology
* Study requires patients to survive until a specific endpoint (hospital discharge, convalescent serum, etc.)
* Study time period focused on reporting the causes of CAP during an outbreak/epidemic
* Patient population restricted to a limited to a narrow subset of CAP (see below for several examples)
  + Patient population: immunocompromised only, elderly only, nursing home only chronic lung disease only, diabetic only
  + Site of care: outpatient only (or patients recruited from outpatient clinics only), intensive care unit only
  + Severity: only patients with severe CAP
* Study excludes patients based on severity
* Study excludes patients with age < 70 years

Calculations:

For Figure 1, the year of study was determined by calculating the midyear for each study. When this information was not available, the year of study was estimated by subtracting 4.5 years from the year of publication. The basis for this approximation was the observation that, among studies that reported the years of investigation, the median interval from midyear of study until publication was 4.5 years.

The frequency of *S. pneumoniae* was defined by the proportion of CAP patients testing positive for the pneumococcus based on > 1 of the abovementioned valid pneumococcal tests. Patients testing positive for *S. pneumoniae* plus an additional pathogen (i.e. coinfected) were included in numerator. When possible, efforts were made to remove from the denominator those patients with CAP of unknown etiology who did not undergo > 1 valid pneumococcal test (other than blood culture). The following tests were not considered valid tests for *S. pneumoniae*: serology, serum or sputum antigen testing, and PCR performed on blood or a respiratory specimen.