

Measure Information Form

Measure Set: Pneumonia (PN)

Set Measure ID #:

Organization	Set Measure ID#	Time Intervals
JCAHO	PN-5a	0-8 hours
CMS/JCAHO	PN-5b	0-4 hours

Performance Measure Name:

(PN-5a) Initial Antibiotic Received Within 8 Hours of Hospital Arrival
(PN-5b) Initial Antibiotic Received Within 4 Hours of Hospital Arrival
(NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE)

Description:

(PN-5a) Pneumonia patients who receive their first dose of antibiotics within 8 hours after arrival at the hospital.

(PN-5b) Pneumonia patients who receive their first dose of antibiotics within 4 hours after arrival at the hospital.

Rationale: There is growing clinical evidence of an association between timely inpatient administration of antibiotics and improved outcome among pneumonia patients. One study found that Medicare pneumonia patients had improved survival if they received antibiotics within 4 hours of admission (Khan 1990). Another study found that shortening the time-to-first-dose to 4 hours was associated with improved survival (McGarvey 1993). In 1995 over 14,000 randomly selected Medicare pneumonia hospitalizations were examined. They found that patients who received their first dose of antibiotic within 3 hours were less likely to die within 30 days than were patients whose antibiotics were delayed, although this association did not become statistically significant until 8 hours following arrival, when a 15% ($P < 0.001$) reduction was noted (Meehan 1995). More recently, a study of 13,771 Medicare pneumonia hospitalizations from 1998-99 found that 30-day mortality was 10% ($P = 0.04$) lower and length of hospital stay was shorter among patients whose first antibiotic was administered within 4 hours when compared with those whose time to first dose was longer. Among patients who had not received antibiotics before arriving at the hospital, administration within 4 hours was associated with 17% reductions in mortality during both hospitalization ($P = 0.01$) and the 30 days following admission ($P = 0.001$) (Bratzler 2001).

Based on these studies, the Infectious Diseases Society of America (2000) and the American Thoracic Society (2001) suggests 8 hours as the maximum time to first antibiotic administration.

Data collected by the National Pneumonia Project indicate that among Medicare pneumonia patients age 65 or older who were hospitalized during 1998-99, the first dose was administered within 8 hours for 83.4%, within 6 hours for 74.9%, and within 4 hours for 57.7%. This represents a significant improvement from 1995, when corresponding rates were 79.4% at 8 hours, 68.8% at 6 hours, and 49.9% at 4 hours (CMS unpublished data). For 1998-99, the rates of administration within 8 hours ranges from 38% to 91% among the states and territories.

Type of Measure: Process

Improvement Noted As: An increase in the rate.

Numerator Statement: Number of pneumonia patients who received their first antibiotic dose within a specified timeframe (as specified under the Set Measure Identifier and description above) from hospital arrival

Included Populations: Not Applicable

Excluded Populations: None

Data Elements:

- *Antibiotic Administration Date*
- *Antibiotic Administration Time*
- *Antibiotic Name*
- *Arrival Date*
- *Arrival Time*

Denominator Statement: Pneumonia patients 18 years of age and older

Included Populations: Patients discharged with:

- *ICD-9-CM Principal Diagnosis Code* of pneumonia as defined in Appendix A, Table 3.1 **OR** *ICD-9-CM Principal Diagnosis Code* of septicemia or respiratory failure (acute or chronic) as defined in Appendix A, Tables 3.2, or 3.3, **AND** an *ICD-9-CM Other Diagnosis Code* of pneumonia (Appendix A, Table 3.1)

Excluded Populations:

- Patients received in transfer from another acute care or critical access hospital, including another emergency department
- Patients who had no working diagnosis of pneumonia at the time of admission
- Patients receiving *Comfort Measures Only*
- Patients who do not receive antibiotics during hospitalization or within 36 hours (2160 minutes) from the time of hospital arrival
- Patients who have received antibiotics within 24 hours prior to hospital arrival
- Patients less than 18 years of age

Data Elements:

- *Admission Date*
- *Admission Source*
- *Antibiotic Administration Date*
- *Antibiotic Administration Time*
- *Antibiotic Name*
- *Antibiotic Received*
- *Antibiotics Prior to Arrival*
- *Birthdate*
- *Comfort Measures Only*
- *ICD-9-CM Other Diagnosis Codes*
- *ICD-9-CM Principal Diagnosis Code*
- *Pneumonia Working Diagnosis on Admission*
- *Transfer From Another ED*

Risk Adjustment: No

Data Collection Approach: Retrospective data sources for required data elements include administrative data and medical record documents. Some hospitals may prefer to gather data concurrently by identifying patients in the population of interest. This approach provides opportunities for improvement at the point of care/service. However, complete documentation includes the principal and other ICD-9-CM diagnosis and procedure codes, which require retrospective data entry.

Data Accuracy:

- Variation may exist in the assignment of ICD-9-CM codes; therefore, coding practices may require evaluation to ensure consistency.
- Health care organizations may want to work with their hospital pharmacy to identify and list the antibiotics that are used in their organization. This list can serve as a reference for the abstractor.
- To be part of the measure population, a patient must have received an antibiotic during the hospitalization.
- The date and time for the initial antibiotic refer to the initial antibiotic administered during the hospital stay, not the antibiotic taken prior to hospital arrival.

Measure Analysis Suggestions: Health care organizations should investigate any patients whose time to antibiotic administration was greater than 2160 minutes (36 hours) for a possible data entry error or a performance improvement opportunity.

This measure seeks to identify the timing of the first antibiotic administered. It is important to note that the measure focuses on the administration of any antibiotic, not necessarily the antibiotic consistent with consensus guidelines. Therefore, data from this measure should be reviewed in conjunction with PN-6, PN-6a, and PN-6b that address appropriate antibiotic selections. For example, an HCO could receive excellent indicator rates for antibiotic administered timing but low rates for giving the appropriate antibiotics consistent with guidelines.

Sampling: Yes, for additional information see the Sampling section.

Data Reported as: Aggregate rate generated from count data reported as a proportion

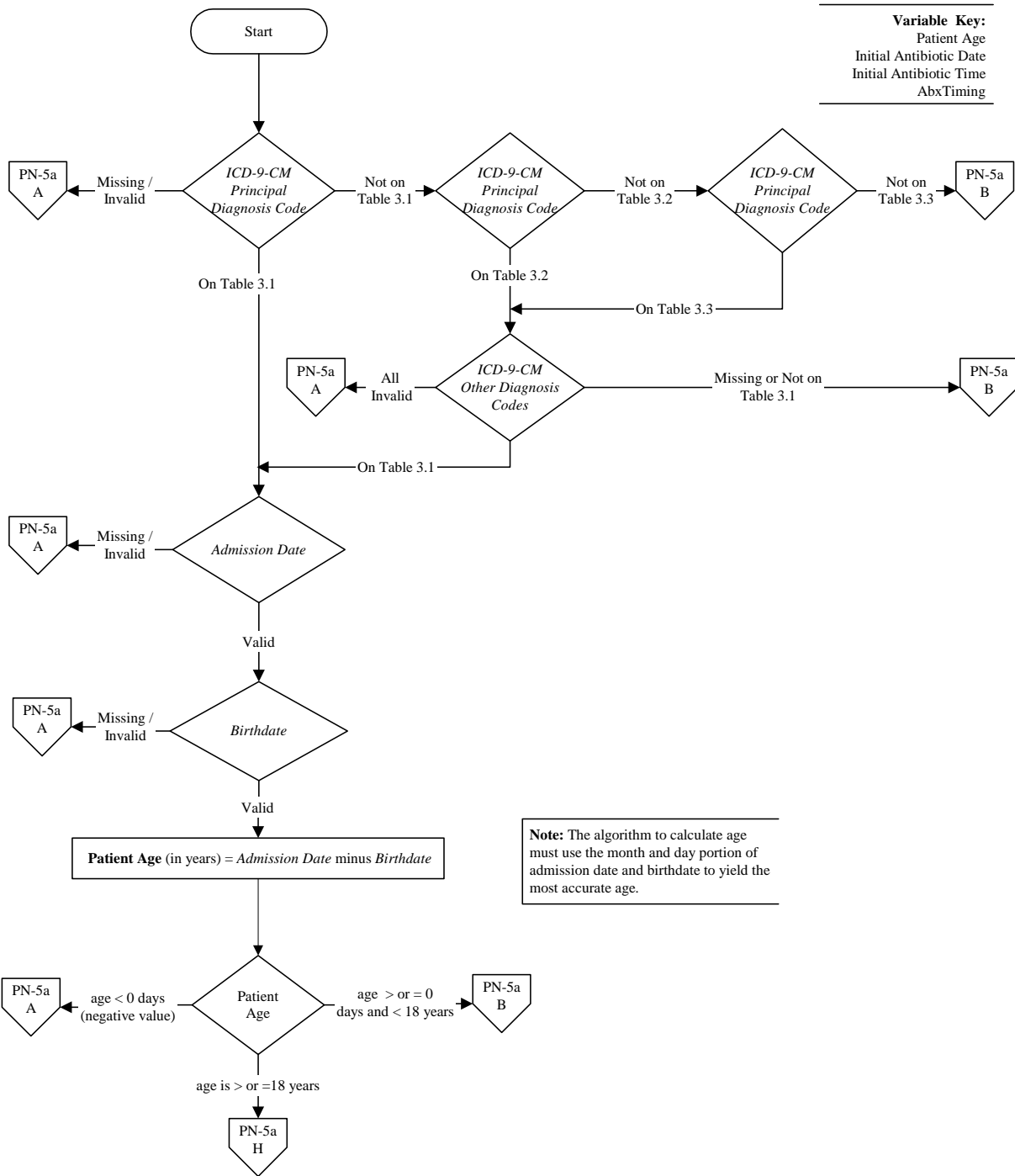
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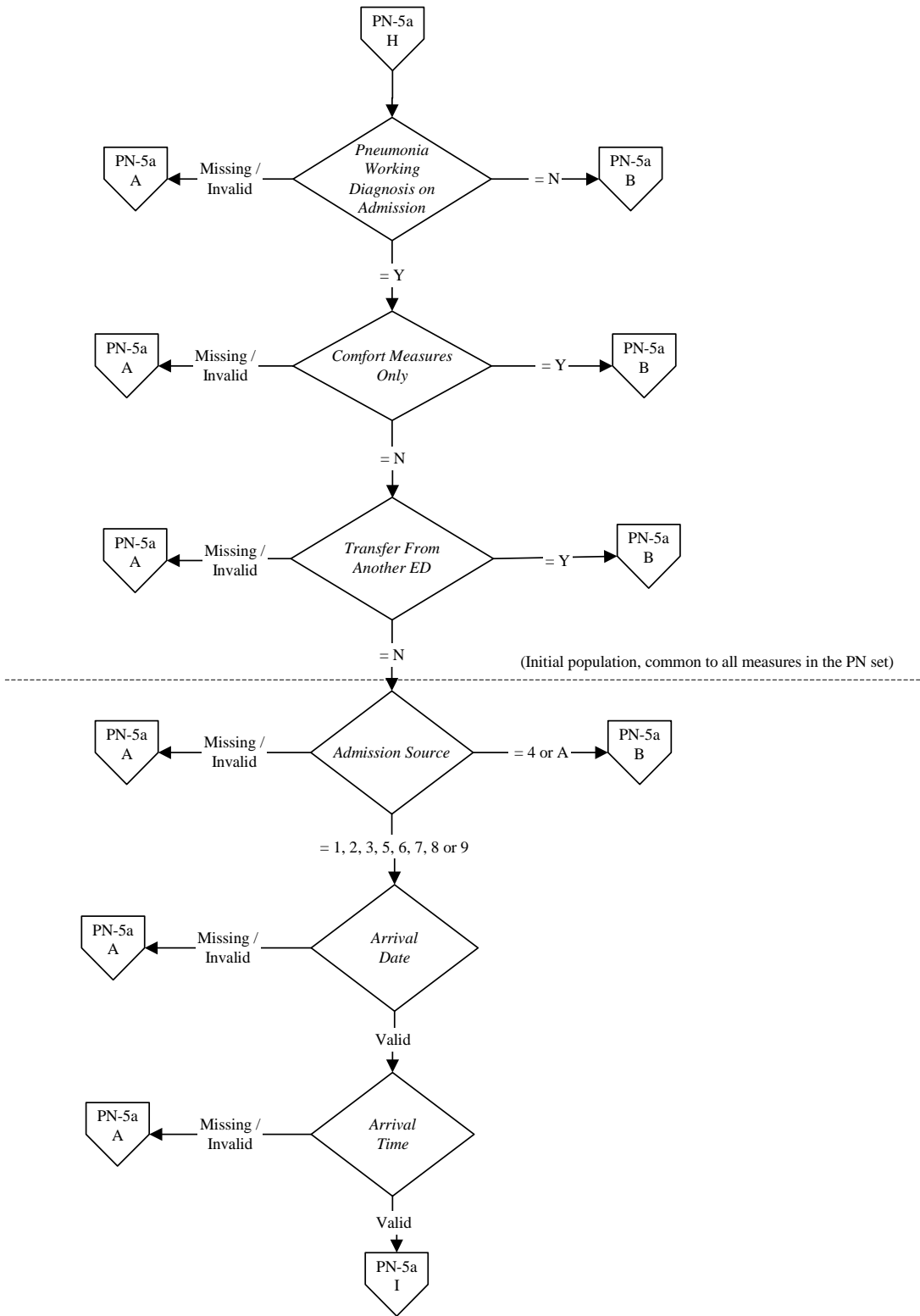
- Bartlett JG, Dowell SF, Mandell LA, et al. Practice guidelines for the management of community-acquired pneumonia in adults. Infectious Diseases Society of America. *Clin Infect Dis*. 2000;31:347-382.
- Bratzler, DW, Houck PM, Nsa W, et al. Initial processes of care and outcomes in elderly patients with pneumonia. {abstract} American College of Emergency Physicians Research Forum, October 15, 2001, Chicago, IL.
- Heffelfinger JD, Dowell SF, Jorgensen JH, Klugman KP, Mabry LR, Musher DM, Plouffle JF, Rakowsky A, Schuchat A, Whitney C and the Drug-Resistant Streptococcus pneumoniae Therapeutic Working Group, “Management of Community-Acquired Pneumonia in the Era of Pneumococcal Resistance: A Report From the Drug-Resistant Streptococcus pneumoniae Therapeutic Working Group.” *Arch Intern Med*, 160:1399-1408, May 22, 2000.
- Houck PM, Bratzler DW, Nsa W, et al. Timing of antibiotic administration and outcomes for Medicare patients hospitalized with community-acquired pneumonia. *Arch Intern Med* 2004; 164: 637-644.
- Khan KL, Rogers WH, Rubenstein LV, et al. Measuring quality of care with explicit process criteria before and after implementation of the DRG-based prospective payment system. *JAMA*. 1990;264:1969-1973.
- Mandell LA, Bartlett JG, Dowell SF, et al. Practice guidelines for the management of community-acquired pneumonia in adults. Infectious Diseases Society of America. *Clin Infect Dis*. 2003;37:1405-1433.
- McGarvey RN, Harper JJ. Pneumonia mortality reduction and quality improvement in a community hospital. *Qual Rev Bull*. 1993;19:124-130.
- Meehan TP, Fine MJ, Krumholz HM, et al. Quality of care, process and outcomes in elderly patients with pneumonia. *JAMA*. 1997;278:2080-2084.
- Niederman MS, Mandell LA, Anzueto A, et al. Guidelines for the management of adults with community-acquired pneumonia. American Thoracic Society. *Am. J. Respir. Crit. Care Med*. 2001;163:1730-1754.

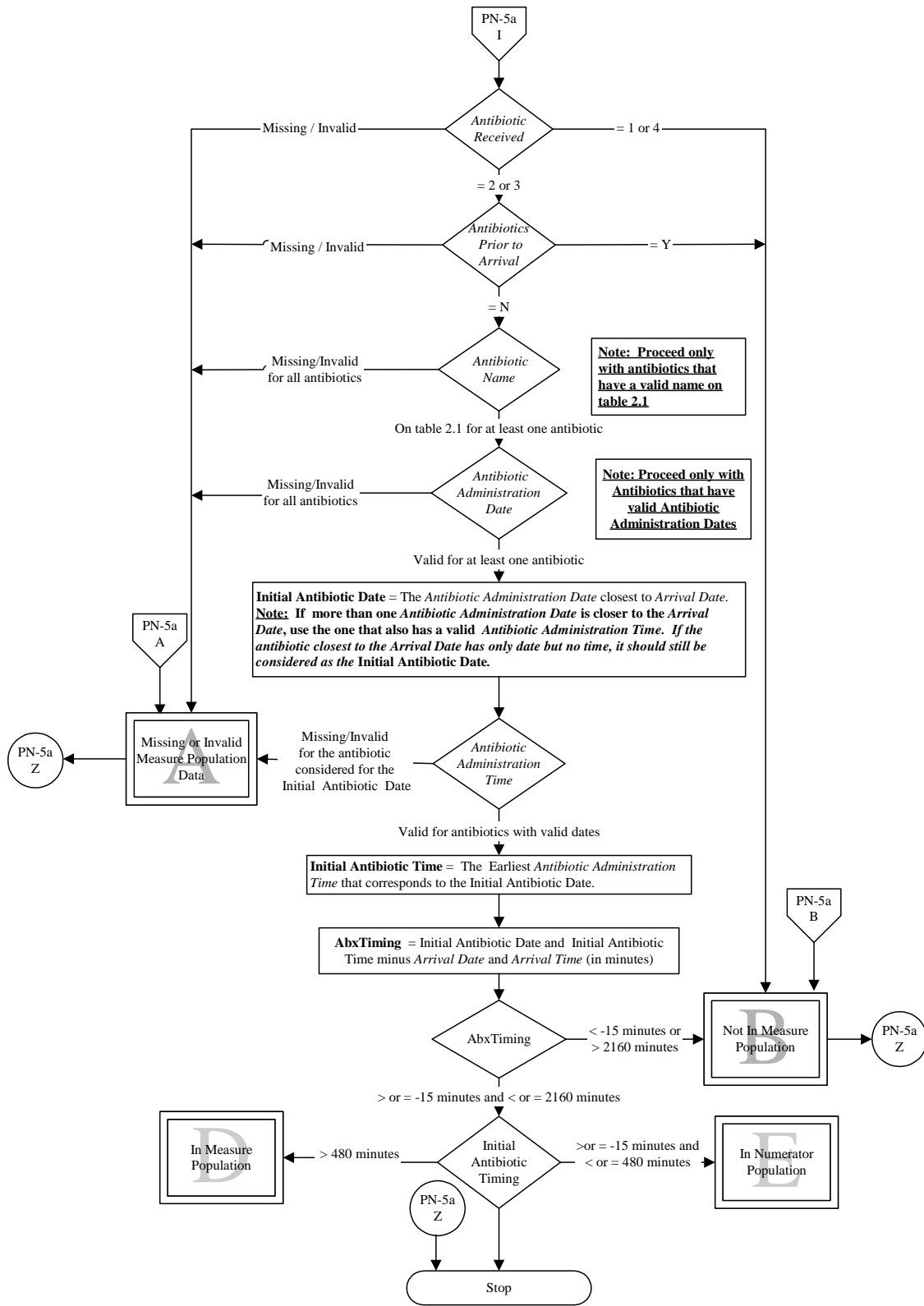
PN-5a: Initial Antibiotic Received Within 8 Hours Of Hospital Arrival.

Numerator: Number of Pneumonia patients who received their first antibiotic dose within 8 hours from hospital arrival.

Denominator: Pneumonia patients 18 years age and older.







PN-5b: Initial Antibiotic Received Within 4 Hours Of Hospital Arrival.

Numerator: Number of Pneumonia patients who received their first antibiotic dose within 4 hours from hospital arrival.

Denominator: Pneumonia patients 18 years of age and older.

