PNEUMONIA AND INFLUENZA (P&I); HOSPITALIZED

*Includes Acute Respiratory Infection (ARI); Case Definition for **Annual** MSMR Update on Pneumonia and Influenza*

Background

The Armed Forces Health Surveillance Branch, formerly the Armed Forces Health Surveillance Center (AFHSC), has conducted ongoing surveillance of acute respiratory illness, to include pneumonia and influenza, since October of 1999. This case definition, modified in June of 2008 to include "acute respiratory infection" (ARI), was developed for the purpose of broad epidemiologic surveillance of cases of hospitalized, severe, pneumonia and influenza. Such surveillance supplements that for influenza cases because pneumonia complicating influenza may not be laboratory-confirmed as due to influenza. Pneumonia cases from all causes increase in incidence during the usual influenza season, but severe influenza epidemics can result in dramatic increases in pneumonia incidence above that usually observed each winter.

Clinical Description

Influenza is often associated with either viral or secondary bacterial pneumonia. Pneumonia is an acute infection of the lungs that involves the lower respiratory tract including the small bronchi and air sacs. Pneumonia and influenza are among the leading causes of hospitalizations of service members and, although less frequent than upper respiratory illness, are often more debilitating.[1]

Case Definition and Incidence Rules

For surveillance purposes, a case of *hospitalized* "pneumonia and influenza" is defined as:

- *One hospitalization* with any of the defining diagnoses of "pneumonia and influenza" (see ICD9 and ICD10 code lists below) in the *first* diagnostic position; or

- *One hospitalization* with any of the defining diagnoses of "acute respiratory infection" (see ICD9 and ICD10 code lists below) in the *first* diagnostic position, *PLUS* a secondary diagnosis, in diagnostic position 2 through 8, with any of the defining diagnoses of "pneumonia and influenza."
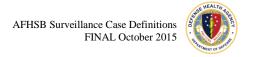
Incidence rules:

For individuals who meet the case definition:

- The incidence date is considered the date of the first hospitalization that includes a diagnosis of hospitalized "pneumonia and influenza".

- An individual is considered an incident case only *once per respiratory illness year* (1 July through 30 June of the following year).

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[1] Armed Forces Health Surveillance Center. Update: Pneumonia-Influenza and Severe Acute Respiratory Illnesses, U.S. Armed Forces, January 1997-April 2008. *Medical Surveillance Monthly Report (MSMR).* 2000 June; Vol 15(5): 2-6.

Case Definition and Incidence Rules *(continued)*

Exclusions:

- None

Codes

The following ICD9 and ICD10 codes are included in the case definition:

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Acute Respiratory Infection (ARI)	J00 (acute nasopharyngitis; common cold)	460 (acute nasopharyngitis)
	J01 (acute sinusitis) – does not include recurrent	*461 (acute sinusitis)*
	J01.0 (acute maxillary sinusitis)	461.0 (acute maxillary sinusitis)
	- J01.00 (acute maxillary sinusitis *unspecified*)	
	J01.1 (acute frontal sinusitis)	461.1 (acute frontal sinusitis)
	- J01.10 (acute frontal sinusitis *unspecified*)	
	J01.2 (acute ethmoidal sinusitis)	461.2 (acute ethmoidal sinusitis)
	J01.20 (acute ethmoidal sinusitis *unspecified*)	
	J01.3 (acute sphenoidal sinusitis)	461.3 (acute sphenoidal sinusitis)
	- J01.30 (acute sphenoidal sinusitis *unspecified*)	
	J01.4 (acute pansinusitis)	461.8 (other acute sinusitis)
	- J01.40 (acute parasinusitis *unspecified*)	
	J01.8 (other acute sinusitis)	
	- J01.80 (other acute sinusitis)	
	J01.9 (acute sinusitis, unspecified)	461.9 (acute sinusitis, unspecified)
	J01.90 (acute sinusitis, unspecified)	
	J02.8 (acute pharyngitis due to other specified organisms)	462 (acute pharyngitis)
	J02.9 (acute pharyngitis, unspecified)	*(continued on next page)*

J03.9 (acute tonsillitis, unspecified) - J03.90 (acute tonsillitis, unspecified)	463 (acute tonsillitis)
J04 (acute laryngitis and tracheitis)	464 (acute laryngitis and tracheitis)
J04.0 (acute laryngitis)	464.0 (acute laryngitis) - 464.00 (acute laryngitis, without mention of obstruction)
J04.1 (acute tracheitis)	464.1 (acute tracheitis)
- J04.10 (acute tracheitis *without* obstruction)	- 464.10 (acute tracheitis, without mention of obstruction)
- J04.11 (acute tracheitis *with* obstruction)	464.11 (acute tracheitis, with obstruction)
J04.2 (acute laryngotracheitis)	464.20 (acute laryngotracheitis without mention of obstruction)
J04.3 (supraglottitis, unspecified)	464.5 (supraglottitis, unspecified)
- J04.30 (supraglottitis, unspecified, without obstruction)	- 464.50 (supraglottitis, without mention of obstruction)
- J04.31 (supraglottitis, unspecified, with obstruction)	- 464.51 (supraglottitis, with obstruction)
J05 (acute obstructive laryngitis [croup] with epiglottitis)	--
J05.0 (acute obstructive laryngitis; croup)	464.2 (acute laryngotracheitis) - 464.01 (acute laryngitis, with obstruction) - 464.21 (acute laryngotracheitis, with obstruction) - 464.4 (croup)
J05.1 (acute epiglottitis)	464.3 (acute epiglottis)
- J05.10 (acute epiglottitis without obstruction)	- 464.30 (acute epiglottitis, without mention of obstruction)
- J05.11 (acute epiglottitis with obstruction)	- 464.31 (acute epiglottitis, with obstruction)
J06 (acute upper respiratory infections of multiple and unspecified site)	465 (acute upper respiratory infections of multiple and unspecified sites)
J06.0 (acute laryngopharyngitis)	465.0 (acute laryngopharyngitis)
J06.9 (acute upper respiratory infection, unspecified)	465.8 (acute upper respiratory infection of other multiple sites) 465.9 (unspecified site)
J20 (acute bronchitis)	*466 (acute bronchitis and bronchiolitis)* *(continued on next page)*

	ICD-10-CM Codes	ICD-9-CM Codes
	- J20.0 (acute bronchitis due to Mycoplasma pneumoniae)	466.0 (acute bronchitis)
	- J20.1 (acute bronchitis due to Hemophilus influenzae)	
	- J20.2 (acute bronchitis due to streptococcus)	
	- J20.3 (acute bronchitis due to coxsackievirus)	
	- J20.4 (acute bronchitis due to parainfluenza virus)	
	- J20.5 (acute bronchitis due to respiratory syncytial virus)	
	- J20.6 (acute bronchitis due to rhinovirus)	
	- J20.7 (acute bronchitis due to echovirus)	
	- J20.8 (acute bronchitis due to other specified organisms)	
	- J20.9 (acute bronchitis, unspecified)	
	J21 (acute bronchiolitis)	466.1 (acute bronchiolitis)
	- J21.0 (acute bronchiolitis due to respiratory syncytial virus)	466.11 (acute bronchiolitis due to respiratory syncytial virus, RSV)
	- J21.1 (acute bronchiolitis due to human metapneumovirus)	466.19 (acute bronchiolitis due to other infectious organisms)
	- J21.8 (acute bronchiolitis due to other specified organisms)	
	- J21.9 (acute bronchiolitis, unspecified)	

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Influenza Pneumonia and Influenza (P&I)	*J09 (influenza due to certain identified influenza viruses)*	--
	J09.X (influenza due to identified novel influenza A viruses)	--
	- J09.X1 (influenza due to identified novel influenza A virus *with pneumonia*)	488.0 (influenza due to identified avian influenza virus) - 488.01 (influenza due to identified avian influenza virus with pneumonia)
		488.8 (influenza due to novel influenza A) - 488.81 (influenza due novel influenza A with pneumonia) *(continued on next page)*

- J09.X2 (influenza due to identified novel influenza A virus *with other respiratory manifestations*)	488.02 (influenza due to identified avian influenza virus with other respiratory manifestations)
	488.82 (influenza due to novel influenza A with other respiratory manifestations)
- J09.X3 (influenza due to identified novel influenza A virus *with gastrointestinal manifestations*)	488.09 (influenza due to identified avian influenza virus with other manifestations)
	488.1 (influenza due to 2009 H1N1 influenza virus)
- J09.X9 (influenza due to identified novel influenza A virus with other manifestations)	488.19 (influenza due to identified 2009 H1N1 influenza virus with other manifestations)
	488.89 (influenza due to novel influenza A with other manifestations)
J10 (influenza due to other identified influenza viruses)	--
J10.0 (influenza due to identified novel influenza A viruses)	--
- J10.00 (influenza due to other identified influenza virus *with unspecified type of pneumonia*)	487.0 (influenza with pneumonia)
- J10.01 (influenza due to other identified influenza virus *with the same other identified influenza virus pneumonia*)	487.1 (influenza with other respiratory manifestations)
- J10.08 (influenza due to other identified influenza virus *with other specified pneumonia*)	487.0 (above) 488.11 (influenza due to identified 2009 H1N1 influenza virus with pneumonia)
J10.1 (influenza due to other identified influenza virus with other respiratory manifestations)	487.1 (above) 488.12 (influenza due to identified 2009 H1N1 influenza virus with other respiratory manifestations)
J10.2 (influenza due to other identified influenza virus with *gastrointestinal* manifestations)	487.8 (influenza with other manifestations)
J10.8 (influenza due to other identified influenza virus with other manifestations)	
- J10.81 (influenza due to other identified influenza virus with other manifestations *with encephalopathy*)	
- J10.82 (influenza due to other identified influenza virus with other manifestations *with myocarditis*)	
- J10.83 (influenza due to other identified influenza virus with other manifestations *with otitis media*)	*(continued on next page)*

	- J10.89 (influenza due to other identified influenza virus *with other manifestations*)	
	J11 (influenza due to unidentified influenza virus)	--
	J11.0 (influenza due to unidentified influenza virus with pneumonia)	--
	- J11.00 (influenza due to unidentified influenza virus *with unspecified type of pneumonia*)	487.0 (above)
	- J11.08 (influenza due to unidentified influenza virus *with specified pneumonia*)	
	J11.1 (influenza due to unidentified influenza virus with other respiratory manifestations)	487.1 (above)
	J11.2 (influenza due to unidentified influenza virus with *gastrointestinal* manifestations)	487.8 (above)
	J11.8 (influenza due to unidentified influenza virus with other manifestations)	
	- J11.81 (influenza due to unidentified influenza virus *with encephalopathy*)	
	- J11.82 (influenza due to unidentified influenza virus *with myocarditis*)	
	- J11.83 (influenza due to unidentified influenza virus *with otitis media*))	
	- J11.89 (influenza due to unidentified influenza virus *with other manifestations*)	
Pneumonia Pneumonia and Influenza (P&I)	--	*484 (pneumonia in infectious diseases classified elsewhere)*
	Translated code to broad; not included	- 484.5 (pneumonia in anthrax)
	A37.01 (whooping cough due to Bordetella pertussis with pneumonia)	- 484.3 (pneumonia in whooping cough)
	A37.11 (whooping cough due to Bordetella parapertussis with pneumonia)	
	A37.81 (whooping cough due to other Bordetella species with pneumonia)	
	A37.91 (whooping cough, unspecified species with pneumonia)	
	A48.1 (Legionnaires' disease)	- 482.84 (pneumonia due to other specified bacteria; legionnaires' disease)

B25.0 (cytomegaloviral pneumonitis)	- 484.1 (pneumonia in cytomegalic inclusion disease)
Translated code to broad; not included	- 484.6 (pneumonia in aspergillosis)
J12 (viral pneumonia, not elsewhere classified)	*480 (viral pneumonia)*
J12.0 (adenoviral pneumonia)	480.0 (pneumonia due to adenovirus)
J12.1 (respiratory syncytial virus pneumonia)	480.1 (pneumonia due to respiratory syncytial virus)
J12.2 (parainfluenza virus pneumonia)	480.2 (pneumonia due to parainfluenza virus)
J12.3 (human metapneumovirus pneumonia)	480.8 (pneumonia due to other viruses not elsewhere classified)
J12.8 (other viral pneumonia)	--
- J12.81 (pneumonia due to SARS-associated coronavirus)	480.3 (pneumonia due to SARS-associated virus)
- J12.89 (other viral pneumonia)	480.8 (above)
J12.9 (viral pneumonia, unspecified)	487.0 (above) 480.9 (viral pneumonia unspecified)
J13 (pneumonia due to Streptococcus pneumoniae)	481 (pneumococcal pneumonia/ streptococcus pneumoniae pneumonia)
J14 (pneumonia due to Hemophilus influenzae)	- 482.2 (pneumonia due to Hemophilus influenza; H.influenzae)
J15 (bacterial pneumonia, not elsewhere classified)	*482 (other bacterial pneumonia)*
J15.0 (pneumonia due to Klebsiella pneumoniae)	- 482.0 (pneumonia due to Klebsiella pneumonia)
J15.1 (pneumonia due to Pseudomonas)	- 482.1 (pneumonia due to Pseudomonas)
J15.2 (pneumonia due to staphylococcus)	482.4 (pneumonia due to staphylococcus)
- J15.20 (pneumonia due to staphylococcus, unspecified)	- 482.40 (pneumonia due to staphylococcus, unspecified)
- J15.21 (pneumonia due to staphylococcus aureus)	--
- J15.211 (pneumonia due to Methicillin susceptible staphylococcus aureus)	- 482.41 (Methicillin susceptible pneumonia due to staphylococcus)
- J15.212 (pneumonia due to Methicillin resistant Staphylococcus aureus)	- 482.42 (Methicillin resistant pneumonia due to staphylococcus)
J15.29 (pneumonia due to other staphylococcus)	- 482.49 (other staphylococcus pneumonia) *(continued on next page)*

J15.3 (pneumonia due to streptococcus; group B)	- 482.32 (pneumonia due to streptococcus; group B)
J15.4 (pneumonia due to other streptococci)	482.3 (pneumonia due to streptococcus)
	- 482.30 (pneumonia due to streptococcus; streptococcus unspecified)
	- 482.31 (pneumonia due to streptococcus; group A)
	- 482.39 (pneumonia due to streptococcus; other streptococcus)
--	482.8 (pneumonia due to other specified bacteria)
J15.5 (pneumonia due to Escherichia coli)	- 482.82 (pneumonia due to other specified bacteria; Escherichia coli)
J15.6 (pneumonia due to other aerobic Gram- negative bacteria)	- 482.83 (pneumonia due to other specified bacteria; other gram negative bacteria)
J15.7 (pneumonia due to Mycoplasma pneumonia)	- 483.0 pneumonia due to other specified organism; mycoplasma pneumoniae)
J15.8 (pneumonia due to other specified bacteria)	- 482.81 (pneumonia due to other specified bacteria; anerobes)
	- 482.89 (pneumonia due to other specified bacteria; other specified bacteria)
J15.9 (unspecified bacterial pneumonia)	482.9 (bacterial pneumonia unspecified)
J16 (pneumonia due to other infectious organisms, not elsewhere classified)	*483 (pneumonia due to other specified organism)*
J16.0 (Chlamydial pneumonia)	- 483.1 (pneumonia due to other specified organism; chlamydia)
J16.8 (pneumonia due to other specified infectious organisms)	- 483.8 (pneumonia due to other specified organism; other specified organism)
J17 (pneumonia in diseases classified elsewhere)	- 484.7 (pneumonia in other systemic mycoses)
	- 484.8 (pneumonia in other infectious diseases classified elsewhere)
J18 (pneumonia, unspecified organism)	486 (pneumonia, organism unspecified)
- J18.0 (bronchopneumonia, unspecified organism)	485 (bronchopneumonia, organism unspecified)
- J18.1 (lobar pneumonia, unspecified organism)	*(continued on next page)*

	- J18.2 (hypostatic pneumonia, unspecified organism)	
	- J18.8 (other pneumonia, unspecified organism)	
	- J18.9 (pneumonia, unspecified organism)	

Development and Revisions

- In October of 2015 the case definition was updated to include ICD10 codes.

- The case definition was originally developed in June of 2008 by AFHSC Medical Surveillance Monthly Report (MSMR) staff for a MSMR article on acute respiratory illness, including "pneumonia and influenza."

Case Definition and Incidence Rule Rationale

In September of 2015 the AFHSB considered adding "one record of a reportable medical event of an influenza-associated hospitalization" to the case finding criteria for this case definition. Due to the frequency of miscodings (i.e., individuals reporting potential influenza cases –who were not hospitalized) and the likelihood that the case definition, based on hospitalized cases only, will capture all true cases of influenza, it was decided not to include reportable medical event records.

Code Set Determination and Rationale

- For ARI, ICD9 code 034 (strep sore throat) corresponds to ICD10codes J02.0 (strep pharyngitis), J03.0 (streptococcal tonsillitis, unspecified) and J03.00 (acute streptococcal tonsillitis, unspecified). These codes are not included in the code set. ICD9 034 was not included in the original code set. AFHSC will investigate how often these codes are used in conjunction with a secondary pneumonia diagnosis when data are available.

- In November of 2009 ICD9 code 488.xx (influenza due to certain identified influenza viruses) was added to the case definition to identify cases caused by other influenza strains, such as the avian influenza (H5N1) (488.0x) or novel pandemic (H1N1) (488.1x) strains.
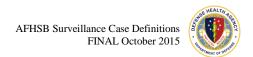
Reports

Using the above case definition, AFHSB reports on *hospitalized* "pneumonia and influenza" in the following reports:

- Annually: Armed Forces Health Surveillance Branch, Military Health System (MHS) Report.

- Periodic MSMR update.

Review

Oct 2015   Case definition reviewed and updated by an AFHSB Senior Managing Epidemiologist and approved by the AFHSB Surveillance Methods and Standards (SMS) working group.

Apr 2011   Case definition reviewed and adopted by AFHSC Surveillance Methods and Standards (SMS) working group.

Jun 2008   Case definition developed and reviewed by the AFHSC MSMR staff.

Comments

None