Vaccination Module

Background

Influenza infections are associated with increased medical costs, hospitalizations, lost productivity, and thousands of deaths every year in the United States. The majority of deaths from seasonal influenza occur in adults aged ≥65 years.[1-4] Annual influenza vaccination is the best way to reduce the risk for complications from influenza infections and in the United States is now recommended for all persons aged ≥6 months.

Annual epidemics of seasonal influenza usually occur during the late fall through early spring each year. During these times, rates of infection with influenza are highest among persons aged ≥65 years of age, in children <2 years and persons of any age who have medical conditions placing them at increased risk for the complications of influenza.[5-7] Occasionally, a variant strain of influenza will emerge that is distinct from the expected seasonal strain and requires a separate vaccination for prevention. In 2009-10, this non-seasonal strain was novel Influenza A (H1N1) 2009. Annual influenza vaccination is the most effective way to prevent influenza virus infection and its complications.

Methodology

The Vaccination Module targets the healthcare facility's inpatient population, who are greater than 6 months of age. Two separate approaches (Summary Method or Patient-Level Method) are used to report data for the Vaccination Module. The module can be completed using either retrospective medical record review (Summary Method or Patient-Level Method) *or* prospective surveillance (Patient-Level Method). Either method may be used during the influenza season. When vaccinations for more than one subtype are recommended during a season, use a single method and report data separately for each vaccination subtype. For example, report a Summary Method record for seasonal vaccination and one for the non-seasonal subtype. Multiple admissions by the same patient during the same month should be evaluated as separate encounters for this module.

A trained individual shall initially seek to identify all inpatient admissions as meeting criteria for seasonal vaccination during the review period, and determine if influenza vaccination was offered, and then either accepted or declined during the course of the patient's admission. Personnel other than the IP may be trained to perform these observations.

The CDC forms 57.130, 57.131, 57.133 are used to collect all required data for this module depending on whether Summary Method or Patient-Level Method is the selected surveillance approach. The minimum requirement to participate in this module is one month during the influenza season (September through April), but maximal benefit is obtained by completing the module for each month of the entire influenza season. An optional tool, *Influenza Vaccination Standing Orders* form (CDC 57.134), is also available to provide a chart document that will allow for the capture of needed data elements to complete this module.

Summary Method

Introduction: The Summary Method requires the use of a single form, the *Vaccination Monthly Monitoring Form – Summary Method* (CDC 57.130) to collect all data for the period of surveillance. A Summary form is completed for each month the facility is following influenza vaccination for the influenza season. This retrospective method consists of determining the total number of patients in eight separate categories during the surveillance month(s). The value of this type of surveillance is the simplicity of data collection requirements.

Settings: This is a facility-wide surveillance in which all NHSN inpatients are monitored during the selected month(s).

Requirements: Surveillance consists of a review of all NHSN inpatients facility-wide to determine 1) whether they meet criteria for seasonal influenza vaccination (refer to the current season's recommendations for details), 2) how many were previously vaccinated, and 3) the number meeting criteria who are offered and receive influenza vaccination during their admission. Ideally, the facility should conduct the surveillance during each month of the influenza season (September through April). Each month in which surveillance is conducted must be included in the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

Definitions: All box numbers refer to boxes on the *Vaccination Monthly Monitoring Form–Summary Method* (CDC 57.130).

NHSN inpatient: A patient whose date of admission to the healthcare facility and the date of discharge are different calendar days.

Total number of patient admissions (Box 1): The count of all NHSN inpatients admitted to the facility.
Total number of patients aged 6 months and older meeting criteria for influenza vaccination (Box 2): The count of NHSN inpatients meeting criteria for vaccination. Include in this count any patients who have been previously vaccinated during the current influenza season.

Total number of patients previously vaccinated during current influenza season (Box 3): During the month selected for surveillance, the count of all NHSN inpatients who had previously received influenza vaccination during the current influenza season by either history or documentation. Patients requiring a second vaccine should not be included in the count of those previously vaccinated.

Total number of patients meeting criteria not previously vaccinated during the current influenza season (Box 4): During the month selected for surveillance, the count of NHSN inpatients meeting criteria (Box 2) minus the count of NHSN inpatients meeting criteria previously vaccinated during the current influenza season (Box 3).

Patients meeting criteria offered vaccination but declining for reasons other than medical contraindication (Box 5): The count of NHSN inpatients meeting criteria offered vaccination but who declined for reasons other than medical contraindication. Refer to Table 1 for examples of personal (non-medical) reasons for declining vaccination.

Patients meeting criteria offered vaccination but having medical contraindication (Box 6): The count of NHSN inpatients offered vaccination but who declined because of medical contraindication(s). Refer to Table 1 for examples of medical contraindication.

Patients meeting criteria receiving vaccination during admission (Box 7): The count of patients with documentation in the medical record of receiving influenza vaccination during the course of their hospital admission prior to being discharged.

Total number of patients offered vaccination (Box 8): The sum of the count of all NHSN inpatients offered vaccination but who declined for reasons other than medical contraindication (Box 5) plus all patients offered vaccination but who declined because of medical contraindication (Box 6) plus all NHSN inpatients with documentation in the medical record of receiving influenza vaccination during the course of their hospital admission prior to being discharged (Box 7). The number in this box should be less than or equal to the number in Box 4.

Refer also to the *Key Terms* chapter for other definitions.

Numerator and Denominator Data: The numerator and denominator data are reported on the *Vaccination Monthly Monitoring Form–Summary Method* (CDC 57.130) in boxes 1-8 for the month(s) selected for surveillance (refer to the instructions for completion for details).

Data Analysis: Data aggregated across the entire facility are stratified by time (e.g., month, influenza subtype, influenza season). Table 2 shows the formulas for metrics that can be calculated from the Summary Method.

Table 1: Formulas for Metrics: Summary Method
All data come from Boxes 1-8 of the Vaccination Monthly Monitoring Form–Summary Method (CDC 57.130)

Metric		**Summary Formula (x 100)**
1	Prevalence rate for inpatients not previously vaccinated among all inpatient admissions	Box 4 / Box 1
2	Adherence rate for offering influenza vaccination to inpatients among all eligible inpatients	Box 8 / Box 4
3	Adherence rate for receiving influenza vaccination by inpatients among all inpatients	Box 7 / Box 4

Table 1: Formulas for Metrics: Summary Method *All data come from Boxes 1-8 of the Vaccination Monthly Monitoring Form–Summary Method* (CDC 57.130)		
Metric		**Summary Formula (x 100)**
4	Adherence rate for receiving influenza vaccination by inpatients among all medically eligible inpatients	Box 7 / Box 4 – Box 6
5	Adherence rate for receiving influenza vaccination by inpatients among all medically eligible, willing inpatients	Box 7 / (Box 4 – Box 6) + Box 5
6	Declination rate for inpatients eligible for influenza vaccination among all inpatients offered vaccine	Box 5 + Box 6 / Box 8
7	Declination rate due to personal (non-medical) reasons for inpatients eligible for influenza vaccination among all inpatients offered vaccine	Box 5 / Box 8
8	Declination rate due to medical contraindications for inpatients eligible for influenza vaccination among all inpatients offered vaccine	Box 6 / Box 8
9	Failure rate for offering vaccine to inpatients medically eligible for influenza vaccination among all medically eligible inpatients	Box 4 – Box 8 / Box 4 – Box 6
10	Prevalence rate of all inpatients previously vaccinated during the current influenza season among all inpatient admissions	Box 3 / Box 1

Patient-Level Method

Introduction: The Patient-Level Method requires the use of two forms, the *Vaccination Monthly Monitoring Form–Patient-Level Method* (CDC 57.131), and the *Patient Vaccination* form (CDC 57.133) to collect all data for the period of surveillance. The patient vaccination forms must be completed when the facility is following influenza vaccination for inpatients. The value of this method is that the information collected will assist facilities in identifying whether NHSN inpatients meeting criteria for influenza vaccination during an admission are actually receiving vaccination, and the details of those vaccinations. Additionally, IPs will be able to identify specific gaps in adherence and recommend changes in practices to ensure that eligible patients are being vaccinated.

Settings: This is a facility-wide surveillance in which all NHSN inpatients are monitored during the selected month(s).

Requirements: Surveillance consists of a review of all NHSN inpatients facility-wide to determine whether they meet criteria for influenza vaccination who are offered and receive influenza vaccination during the course of their admission. Surveillance must be conducted for at least one calendar month during the influenza season as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106). During seasons when seasonal and non-seasonal subtype vaccinations are recommended, such as 2009-10, monitoring is required for all influenza vaccinations, unless both doses have been received. Patients requiring a second vaccine shouldn't be included in the count of those previously vaccinated. A *Vaccination Monthly Monitoring form–Patient-Level Method* (CDC 57.131) and a *Patient Vaccination* form (CDC 57.133) need to be completed for each of the 2 doses given. (See latest CDC/ACIP recommendations for current season details). Ideally the facility should conduct the surveillance during each month of the influenza season (September through April).

The Patient-Level Method requires determination of the number of NHSN inpatients in the following categories for the month selected for review. (All box numbers refer to the boxes found on the *Vaccination Monthly Monitoring Form–Patient-Level Method* [CDC 57.131]):

- Total number of NHSN patient admissions (Box 1).
- Total number of NHSN patients previously vaccinated during the current influenza season (Box 2).

In addition, all NHSN inpatient admissions found to meet criteria for influenza vaccination but not previously vaccinated during the current influenza season will need to have a *Patient Vaccination* form (CDC 57.133) completed as indicated. For those patients who decline influenza vaccination, reasons for declination (medical contraindications and personal) are captured (Table 2).

Table 2: Examples of Medical Contraindications to Influenza Vaccination and of Personal Reasons for Declining Influenza Vaccinations	
Medical Contraindications	Allergy to vaccine components History of Guillain-Barré syndrome within 6 weeks of previous influenza vaccination Current febrile illness (Temp >101.5°)
Personal (non-medical) reasons for declining vaccination	Fear of needles/injections Fear of side effects Perceived ineffectiveness of vaccine Religious or philosophical objections Concern for transmitting vaccine virus to contacts

Review all NHSN inpatient admissions and determine whether they meet the criteria for influenza vaccination. Note that all NHSN inpatients that meet criteria but have previously been vaccinated during the current influenza season do not require a *Patient Vaccination* form (CDC 57.133) to be completed, but should be totaled and entered on the *Vaccination Monthly Monitoring Form–Patient-Level Method* (CDC 57.131) in Box 2.

Definitions: All box numbers refer to the boxes found on the *Vaccination Monthly Monitoring Form–Patient-Level Method* (CDC 57.131).

NHSN Inpatient: A patient whose date of admission to the healthcare facility and the date of discharge are different calendar days.

Total number of patient admissions (Box 1): The count of all NHSN inpatients admitted to the facility.

Total number of patients previously vaccinated during the current influenza season (Box 2): The count of all NHSN inpatients who had previously received influenza vaccination during the current influenza season by either history or documentation. Patients requiring a second vaccine should not be included in the count of those previously vaccinated, unless both doses have been received.

Refer also to the NHSN Key Terms chapter, for other definitions.

Numerator and Denominator Data: Numerator data are reported on the *Patient Vaccination* form (CDC 57.133) (refer to the instructions for completion for details). In addition, some numerator and all denominator data are reported on the *Vaccination Monthly Monitoring Form–Patient-Level Method (*CDC 57.131) (refer to the instructions for completion for details).

Data Analysis: Data aggregated across the entire facility are stratified by time (e.g., month, influenza subtype, influenza season). Table 3 shows the formulas for metrics that can be calculated from the Patient-Level Method.

Table 3: Formulas for Metrics: *Patient-Level Method* Data come from two CDC forms: Boxes 1 - 4 of the *Vaccination Monthly Monitoring Form–Patient-Level Method (*CDC 57.131) *Patient Vaccination (PV)* form (CDC 57.133)		
Metric		**Patient Vaccination Formula (x 100)**
1	Prevalence rate for inpatients not previously vaccinated among all inpatient admissions	Box 4 Box 1
2	Adherence rate for offering influenza vaccination to inpatients among all eligible inpatients	Total # PV Forms "Vaccine offered" = "Yes" Box 4
3	Adherence rate for receiving influenza vaccination inpatients among all inpatients	Total # PV Forms "Vaccine administered" = "Yes" Box 4
4	Adherence rate for receiving influenza vaccination by inpatients among all medically eligible inpatients	Total # PV Forms) "Vaccine administered" = "Yes" Box 4 – Total # PV Forms "Vaccine declined" = "Yes" due to medical contraindications
5	Adherence rate for receiving influenza vaccination by inpatients among all medically eligible, willing inpatients	Total # PV Forms "Vaccine administered" = "Yes" (Box 4 –Total # PV Forms "Vaccine declined = "Yes" due to medical contraindication) + "Vaccine declined" = "Yes" due to personal reasons
6	Declination rate for inpatients eligible for influenza vaccination among all inpatients offered vaccine	Total # PV Forms "Vaccine declined" = "Yes" Total # PV Forms "Vaccine offered = "Yes"
7	Declination rate due to personal (non-medical) reasons for inpatients eligible for influenza vaccination among all inpatients offered vaccine	Total # PV Forms "Vaccine declined" = "Yes" due to personal reasons Total # PV Forms "Vaccine offered" = "Yes"
8	Declination rate due to medical contraindications for inpatients eligible for influenza vaccination among all inpatients offered vaccine	Total # PV Forms "Vaccine declined" = "Yes" due to medical contraindications Total # PV Forms "Vaccine offered"= "Yes"

Table 3: Formulas for Metrics: *Patient-Level Method* Data come from two CDC forms: Boxes 1 - 4 of the *Vaccination Monthly Monitoring Form–Patient-Level Method (*CDC 57.131) *Patient Vaccination (PV)* form (CDC 57.133)		
Metric		**Patient Vaccination Formula (x 100)**
9	Failure rate for offering vaccine to inpatients medically eligible for influenza vaccination among all medically eligible inpatients	Box 4 – Total # PV Forms "Vaccine offered" = "Yes" "Vaccine declined" = "Yes" due to medical contraindications
10	Prevalence rate of all inpatients previously vaccinated among all inpatient admissions	Box 3 Box 1

References

1. Simonsen L, Reichert TA, Viboud C, Blackwelder WC, Taylor RJ, Miller MA. Impact of influenza vaccination on seasonal mMortality in the US elderly population. Arch Intern Med. 2005;165(3):265-72.
2. Thompson WW, Moore MR, Weintraub E, Cheng PY, Jin X, Bridges CB, et al. Estimating influenza-associated deaths in the United States. Am J Public Health. 2009;99 Suppl 2:S225-30.
3. Thompson WW, Shay DK, Weintraub E, Brammer L, Cox N, Anderson LJ, et al. Mortality associated with influenza and respiratory syncytial virus in the United States. JAMA. 2003;289(2):179-86.
4. Thompson WW, Weintraub E, Dhankhar P, Cheng PY, Brammer L, Meltzer MI, et al. Estimates of US influenza-associated deaths made using four different methods. Influenza Other Respi Viruses. 2009;3(1):37-49.
5. Barker WH. Excess pneumonia and influenza associated hospitalization during influenza epidemics in the United States, 1970-78. Am J Public Health. 1986;76(7):761-5. PMCID: 1646876.
6. Barker WH, Mullooly JP. Impact of epidemic type A influenza in a defined adult population. Am J Epidemiol. 1980;112(6):798-811.
7. Monto AS, Kioumehr F. The Tecumseh Study of Respiratory Illness. IX. Occurence of influenza in the community, 1966--1971. Am J Epidemiol. 1975;102(6):553-63.