ILI Surveillance Project
Detailed Design Logic
For Non-RPMS Systems

IHS Office of Information Technology
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Introduction:

The Indian Health Service and the entire Nation are dealing with responding to the worldwide nationwide outbreak of a newly identified Influenza A (H1N1) virus (commonly called Swine Flu). On Sunday, April 26, 2009, The U.S. Department of Health and Human Services declared a Public Health Emergency for Swine Flu under section 319 of the Public Health Service Act. As per the DHHS Medical Surge Capacity and Capability Handbook, *"Following a section 319 declaration, the Secretary can, among other things, take appropriate actions in response to the emergency, such as conducting and supporting investigations into the cause, treatment, or prevention of the disease or disorder."*

One of the most important parts of our response to an outbreak of influenza is disease surveillance. Disease surveillance in this case refers to the collection of information on influenza activity. This information allows epidemiologists to assist facilities with their clinical responses, guide measures such as school closures and other disease mitigation techniques, plan deployment of assets such as personal protective equipment and antiviral medicines from the Strategic National Stockpile, and make sure that diagnostic resources such as influenza test kits can be sent to wherever there is influenza activity. Disease surveillance allows us to respond rapidly to local outbreaks and to minimize harm to our patients.

A cornerstone of surveillance for influenza is monitoring of "influenza-like illness" (ILI), which has been shown to spike in areas of influenza activity. The IHS Office of Information Technology, in cooperation with the IHS Division of Epidemiology and Disease Prevention, has designed a report intended, in near real-time, to monitor those specific ICD-9 diagnosis codes related to influenza-like illness that have been validated by the Centers for Disease Control and Prevention (CDC) as useful in identification of communities with possible influenza infection. The report was created for the Resource and Patient Management System (RPMS) but the simple logic of this report may be easily reproduced on other non-RPMS systems. Exporting and analyzing the reports should be the same regardless of whether they originated on RPMS or non-RPMS systems.

This document describes an automated report that should be configured to run nightly. This report will include specific data from the information system that will facilitate the tracking and early identification of potential influenza outbreak situations in AI/AN communities. Encounter data from visits with diagnoses including at least one of the 36 "ILI" ICD-9 codes can be set up to securely export to the Indian Health Service Division of Epidemiology and Disease Prevention in Albuquerque for analysis. IHS anticipates that these data may give us early sentinel awareness of flu outbreaks in AI/AN people. Data to be exported include the following:

- Unique Registration ID
- Gender
- Date of Birth
- Community of Residence
- Location of Encounter
- Date of Visit
- ILI Diagnoses
- Temperature value
- Unique Visit ID
- Denominator count of visits
- Date Visit last Modified

The report includes information on the total number of medical visits (denominator count of visits) so that the proportion of encounters attributable to ILI may be monitored. The patch is designed to run nightly, exporting data for the duration of the declared Public Health Emergency.

NOTE: The intent of the RPMS patch, and of the logic described below, is to generate a daily report, for surveillance purposes, of the cumulative occurrence of visits with ILI diagnoses since March 21, 2009. The data can be parsed to determine how many visits with ILI diagnoses occurred on any given date, and the relative frequency of those visits compared to the total visits to medical clinics on that date. The report/logic will not provide assistance with case identification for H1N1 influenza.

Logic:

The following logic is used by IHS PCC Suite v1.0 patch 2 to generate an export file of visits. The visits exported are those to a selected set of clinics (see Table 1 below) on which at least one of the diagnoses is from a list of influenza-like illness ICD-9 codes defined by the CDC (see Table 2 below). The following process is scheduled to run nightly (after midnight).

1. Checks today's date. If today's date is greater than July 1, 2009, processing stops. This is the "auto stop" date. A site can "un-schedule" the option at an earlier date if desired.

2. The visit file is scanned and all visits with a visit date of 3/21/2009 through yesterday (T-1) are reviewed:
    a. If the visit is a deleted visit it is skipped.

b. If the visit has zero dependent entries it is skipped (these visits have no data attached to them and will happen if a visit is created at check-in but no data has been entered for that visit yet).
c. If the visit is not ambulatory (defined as service categories of Ambulatory, Observation, Day Surgery or Nursing Home) the visit is skipped. With this logic we are eliminating Hospitalizations, Telephone calls, Chart Reviews, etc.
d. The Clinic Stop Code on the visit is checked. If the clinic is not one included in the list of medical clinics shown in Table 1 below, the visit is skipped.
e. The patient is examined. If the patient is identified as a demo or test patient (in RPMS, if the name of the patient contains "DEMO,PATIENT") the visit is skipped.
f. At this point, a counter by location and visit date is incremented by 1. This is the count of visits that ends up in the 13th comma piece of the export record and indicates the number of total visits to these clinics that occurred on this visit date to this location of encounter.
g. The diagnoses on the visit are reviewed. If any of the diagnoses is contained in the ILI surveillance ICD-9 list (Table 2), processing continues for the visit. If none of the visit ICD codes is contained in the ILI list, processing stops for this visit and the visit information is not exported.

3. If the visit passes all of the above criteria then an export record is generated with the following comma delimited format.

Comma Piece	Description
1	Unique Registration ID (15 digits), defined as the database ID (5 digits) concatenated with the DFN (internal entry number) of the patient (left zero filled to 10 digits).
2	Health Record Number (HRN – 6 digits). The HRN of the patient at the location of encounter of the visit is passed; if the patient does not have an HRN at the location of encounter then the HRN at the site to which the user is logged in will be passed.
3	The gender of the patient: M or F
4	DOB of the patient in DDMMMYYYY format (e.g. 15JAN1987)
5	Current Community of Residence of the Patient. State-County-Community code is passed (IHS Standard Code Book)
6	The ASUFAC of the location of encounter (IHS Standard Code Book)
7	The date of the visit in DDMMMYYYY format
8	Diagnosis 1 that is an ILI diagnosis (see Table 2 below)

9	Diagnosis 2 that is an ILI diagnosis
10	Diagnosis 3 that is an ILI diagnosis
11	Temperature (Fahrenheit – nnn.n). If more than 1 temperature is taken and recorded on a visit the highest temperature is passed.
12	The unique ID of the visit (15 digits), defined as the database ID (5 digits) concatenated with the Internal Entry Number of the visit (left zero filled to 10 digits).
13	The total number of visits to the ILI set of clinics (see Table 1 below) to this location of encounter for this visit date.
14	The date the visit was last modified in DDMMMYYYY format.

Once all visits are reviewed and all of the export records are generated, the export is saved to a host file. The host file is named FLU_asufac_date.txt. Example: FLU_000101_20090501.txt. This file is sent via FTP to IHS OIT in Albuquerque. Facilities desiring to send ILI surveillance export files to OIT for analysis should contact the OIT Help Desk (support@ihs.gov or 888-830-7280) for secure FTP access credentials. Alternatively, sites may choose to examine the export file locally or send it to a different system for analysis.

Table 1: ILI Surveillance Clinics (IHS Standard Code Book Clinic Stop Codes)

Clinic Code	Description
01	GENERAL
06	DIABETIC
10	GYN
12	IMMUNIZATION
13	INTERNAL MEDICINE
20	PEDIATRICS
24	WELL CHILD CARE
28	FAMILY PRACTICE
30	EMERGENCY ROOM
57	EPSDT
70	WOMEN'S HEALTH
80	URGENT CARE
89	EVENING

Table 2: ILI Surveillance ICD-9 Diagnoses

ICD-9	Description
079.89	Viral infection NEC
079.99	Viral infection NOS
382.00	Otitis media, acute suppurative NOS
382.9	Otitis media NOS
460	Nasopharyngitis, acute
461.8	Other acute sinusitis
461.9	Acute sinusitis, unspecified
462	Pharyngitis, acute
463	Acute tonsillitis
464.00	Laryngitis, acute, without obstruction
464.10	Tracheitis, acute, without obstruction
464.20	Laryngotracheitis, acute, without obstruction
465.0	Laryngopharyngitis, acute
465.8	Infectious upper respiratory, multiple sites, acute NEC
465.9	Infectious upper respiratory, multiple sites, acute NOS
466.0	Bronchitis, acute
466.11	Bronchiolitis due to respiratory syncytial virus
466.19	Bronchiolitis, acute, due to other infectious organism
478.9	Disease, upper respiratory NEC/NOS
480.0	Pneumonia due to adenovirus
480.1	Pneumonia due to respiratory syncytial virus
480.2	Pneumonia due to parainfluenza
480.8	Pneumonia due to virus NEC
480.9	Viral pneumonia unspecified
484.8	Pneumonia in other infectious disease NEC
485	Bronchopneumonia, organism NOS
486	Pneumonia, organism NOS
487.0	Influenza with pneumonia
487.1	Influenza with respiratory manifestation NEC
487.8	Influenza with manifestation NEC
490	Bronchitis NOS
780.6	Fever
780.60	Fever, unspecified
780.61	Fever presenting with conditions classified elsewhere
784.1	Pain, throat
786.2	Cough