



Proposed NHSN Modules: Moving from Ideas to Implementation and Some Key Steps Along the Way


NIOSH Stakeholders Meeting
November 16 – 17, 2009

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Division of Healthcare Quality Promotion

National Center for Preparedness, Detection and Control of Infectious Diseases
Centers for Disease Control and Prevention

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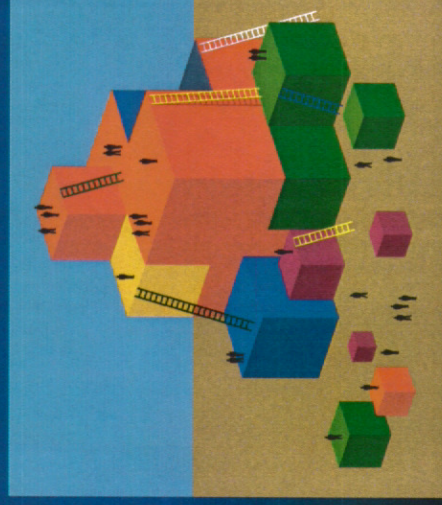


Some Key Steps in Moving from Ideas to Implementation

- **Protocol Creation**
- **Requirements Gathering with Subject Matter Experts (SMEs)**
- **Data Collection Forms Design**
- **Field Instructions (eventually become user instructions)**
- **Joint Application Development Sessions**
- **Define Analysis Datasets**

Steps for Developing a Module in NHSN*

- Protocol Creation
- Requirements Gathering with Subject Matter Experts (SMES)
- Data Collection Forms Design
- Field Instructions (eventually become user instructions)
- Joint Application Development Sessions
- System Development
- System Testing
- OMB Submission
- User Training
- Define Analysis Datasets
- NHSN Website Update
- VA Scan
- Deployment
- Pilot Testing (9 or fewer sites if OMB pending)
- User Support



* Electronic upload using Clinical Document Architecture (CDA) requires additional steps

Protocol



- Should be written at the beginning of the requirements process
- Draft can be written by internal (NIOSH) SME with significant input by expert working group
 - Background
 - Necessity for collecting the information
 - Current statistics
 - Organizational, government, and/or subject matter publications and meetings supporting the effort
 - Settings
 - Where the surveillance will be done and by whom
 - Internal documents or information that will be used as primary source documents
 - Requirements
 - How often the data will be collected
 - Minimum requirements for participation in the module

Protocol (cont.)

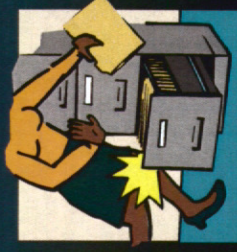
- Definitions
 - All key terms used in the module should have standard definitions
 - Cases or events should have surveillance definitions
- Forms
 - Which forms will be used to collect the information
- Methods
 - Surveillance methodology
 - Numerators and denominators
- Analysis
 - Types of analysis that can be done using the data
- Appendix
 - Code lists
 - Definitions (if too large to be contained in the body of the document)

The clearer and more complete the protocol at the outset, the easier the design and development process!

F.Y.I.

Requirements Gathering

- Establish working groups
 - One for each module or subject within the module
 - Consist of at least one NIOSH SME and others from outside (healthcare facilities, academia)
 - 7 – 10 members
 - Weekly conference calls
 - Public health analyst and business analyst included
 - Once data elements are identified, forms can be designed
 - Expect at least 6 months per module (or subject – depending on complexity)



Data Collection Forms

- Public Health Analyst designs forms in consultation with Business Analyst
- Working group review and respond
- Help define flow of information
- Field definitions are created while forms are in design phase
- Field-by-field definitions are placed in information model and in user instruction tables.

Joint Application Development (JAD) Sessions



- Initiate after initial subject matter requirements have been collected
- Include business analyst, database administrator, tester, internal SME, public health analyst, and others
- Develop or modify use cases
- Define business rules for fields and the relationships between fields and forms.
- Often complex and time-consuming

The Use Case

“The use case describes the system’s behavior under various conditions as the system responds to a request from one of the stakeholders, called the primary actor.”

(Alistair Cockburn: Writing Effective Use Cases)

In other words, it describes the system interface with the user at a high level. It is used by the development and testing teams in creating the user interface.

Use Cases in NHSN

- NHSN has ~ 130 use cases and supplemental requirements documents
- Some are used in all components
- Healthcare Personnel Safety uses 64
- Where possible, new modules are designed to fit into existing use cases
- Use cases include business rules for interaction between forms (screens)

The Use Case Example

6. WORKFLOW

6.1 Task Flow Description

6.1.1 Workflows

Basic Workflow

Task	System Response
1. Indicate desire to add exposure event	Prompt user to identify HCW record for event
2. Enter HCW ID	Invoke Find HCW use case using HCW ID as precondition to find a HCW record accessible to user (with this HCW ID). Display HCW record data fields – with fields editable for authorized users Disable (for entry) fields for A) HCW ID and B) Facility Organization ID for HCW record Prompt user to enter remaining event data fields
3. Enter event data	Validate entries
Indicate desire to save new event (e.g., via a Save/Submit button)	Check if entry constitutes duplicate event record Save/store the event record Notify the user that the record has been saved/stored

HCW Record Related Exceptions

1. For Actor Action in Step 2: The user may indicate a desire (e.g., via a "Find HCW" button) to find an HCW record (e.g., because s/he does not know the

Information Data Model

- Managed by the database administrator
- Variable name, label, description, field type, and business rules for in-field edits.
- Includes code sets (e.g., pathogens, ICD-9 procedures, ISBT-128 blood products)

Information Data Model

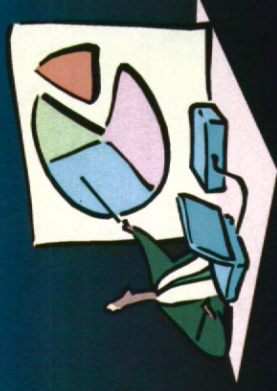
Planned Version	MHSH Table	MHSH Column	Value Set	Description	Entry Method	Required	Format	Values
	prophy_treat	orgID		Facility ID number	System	R	autofilled	
	prophy_treat	medAdminID		Medication administration ID number	System	R	autofilled	
	prophy_treat	hcwID		HCW ID number	User entered	R	Alphanumeric(15)	
	prophy_treat	expID		BBP Exposure event number	System	R	Number	
5.0	prophy_treat	infAgent		Infectious agent	user entered	R		HIV - HIV/AIDS FLU - Influenza Following not in-scope for 5.0 PER - Pertussis VAR - Varicella HER - Herpes Zoster MEA - Measles MEN - Meningococcus
6.0	prophy_treat	fluVaccSubtype	fluVaccSubtype	Influenza subtype	single selection	R	Character(11)	SEASONAL - Seasonal NONSEASONAL - Non-seasonal
6.0	prophy_treat	nonSeasType	nonSeasType	Non-seasonal flu type	auto-populate	C	Character(5)	H1N1
	prophy_treat	fluSeason			single selection	C	Character(9)	App should populate values for the current season (default)

Healthcare Personnel Safety in NHSN

- What already exists that can be applied to the creation of NIOSH modules?
 - Healthcare Personnel Safety Component structure
 - Enrollment
 - Facility information
 - User set-up
 - Group function
 - Healthcare worker demographic record
 - Code sets (e.g., occupation codes)
 - Facility locations
 - Reporting plan (with modifications)
 - Annual survey (may require additional fields)
 - Use cases (with modifications)

Define Analysis Datasets

- SMEs should define their analysis goals during the protocol process
- Analysis datasets and rates are created and tested at the end of the development process (near the time when the system is ready for deployment and test data have been entered)





Department of Health and Human Services
Centers for Disease Control and Prevention

NHSN - National Healthcare Safety Network (ISD-CLFT-NHSN1)

NHSN Home | My Info | Contact us | Help

Logged into Pleasant Valley Hospital (ID 10312) as RUBY.
Facility Pleasant Valley Hospital (ID 10312) is following the HPS component.

- NHSN Home
- Reporting Plan
- HCW
- Vaccination
- Lab Test
- Exposure
- Prophyl/Treat
- Analysis
- Surveys
- Users
- Facility
- Group
- Log Out

NHSN Healthcare Personnel Safety Component Home Page

Use the Navigation bar on the left to access the features of the application.

Assurance of Confidentiality: The information obtained in this surveillance system that would permit identification of any individual or institution is collected with a guarantee that it will be held in strict confidence, will be used only for the purposes stated, and will not otherwise be disclosed or released without the consent of the individual, or the institution in accordance with Sections 304, 306 and 308(d) of the Public Health Service Act (42 USC 242b, 242k, and 242m(d)).

NHSN maintenance may occur nightly between 12am and 6am Eastern time.

<http://www.cdc.gov/nhsn/>