Distributing Countermeasures and Reporting their Utilizations through an Integrated Informatics Approach: Countermeasure Tracking Systems

Barb Nichols, BS[1]; Michele D. Renshaw, BS[1]; Sanjeeb Sapkota, MBBS, MPH[1]; Stephanie Dulin, BS, MBA[1]; Guy Faler, MBA, PMP[2]; Benjamin Erickson, BS[1]; Sarah Waite, MBA, PMP[3]; Leslie Lee, BS[3]; Ulrica Andujar, MPH, CHES[1]; and Jeanne Tropper, MS, MPH[1]

[1]Centers for Disease Control and Prevention (CDC); [2]Northrop Grumman Information Technology, contracted to CDC and [3]SRA International, Inc., contracted to CDC

Background

- The Pandemic and All-Hazards Preparedness Act (PAHPA) encourages the rapid distribution of countermeasures and the reporting of their utilization for an efficient containment of any hazard.
- Recent events have shown that information systems are critical in emergency response management.
- Public health must be ready at all times to respond to hazardous events, including the capability to manage information, communicate it and maintain visibility across all levels of public health.

Purpose

The purpose of this poster is to highlight each of the Countermeasure Tracking Systems' (CTS) components and their capability to interoperate in order to enhance public health's response during an emergency. The four components of the CTS program are:
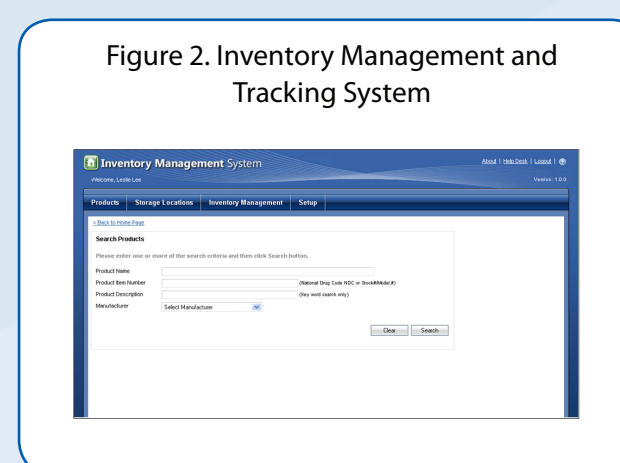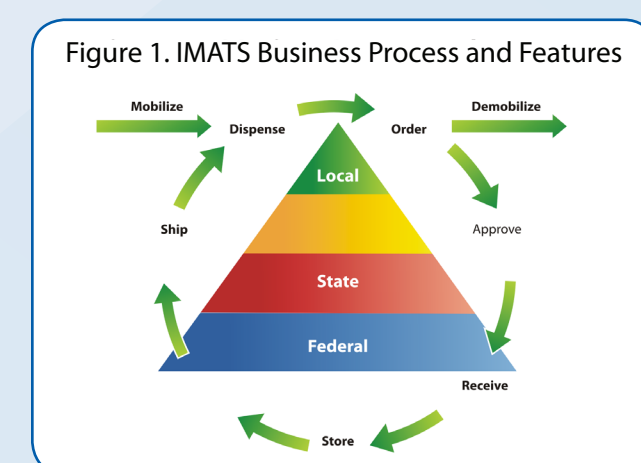
- Inventory Management and Tracking System (IMATS)
- Countermeasure Inventory Tracking (CIT) Dashboard
- Countermeasure and Response Administration (CRA)
- Communications Portal

Overview

- The CTS program supports an integrated systems approach, comprised of closely related informatics components to enhance public health capabilities during an emergency response.
- The 2009 H1N1 pandemic influenza event tested capabilities of existing CTS applications and prompted the need for additional components to further enhance public health efforts.
- H1N1 Event and Outcomes:
  - In addition to the tracking of vaccine doses administered, the CRA system also tracked aggregate data of antiviral and personal protective equipment (PPE) inventory on hand and at the state, regional, and local levels.
  - The Division of Strategic National Stockpile (DSNS) was asked to provide information to multiple agencies regarding countermeasure inventories at state and local levels. The lack of a means to collect this information highlighted DSNS' need for an increased visibility down to the delivery level. DSNS partnered with CTS to build an inventory management and tracking system to assist public health providers during a response.
  - Development of a Communications Portal was initiated to provide a central place for disseminating critical information regarding inventory management to DSNS partners and receiving their feedback in a timely manner during a public health emergency.
  - The CIT application was enhanced to provide federal leaders with a "dashboard" report of critical H1N1 supplies available within the commercial drug sector to assist in decision making.
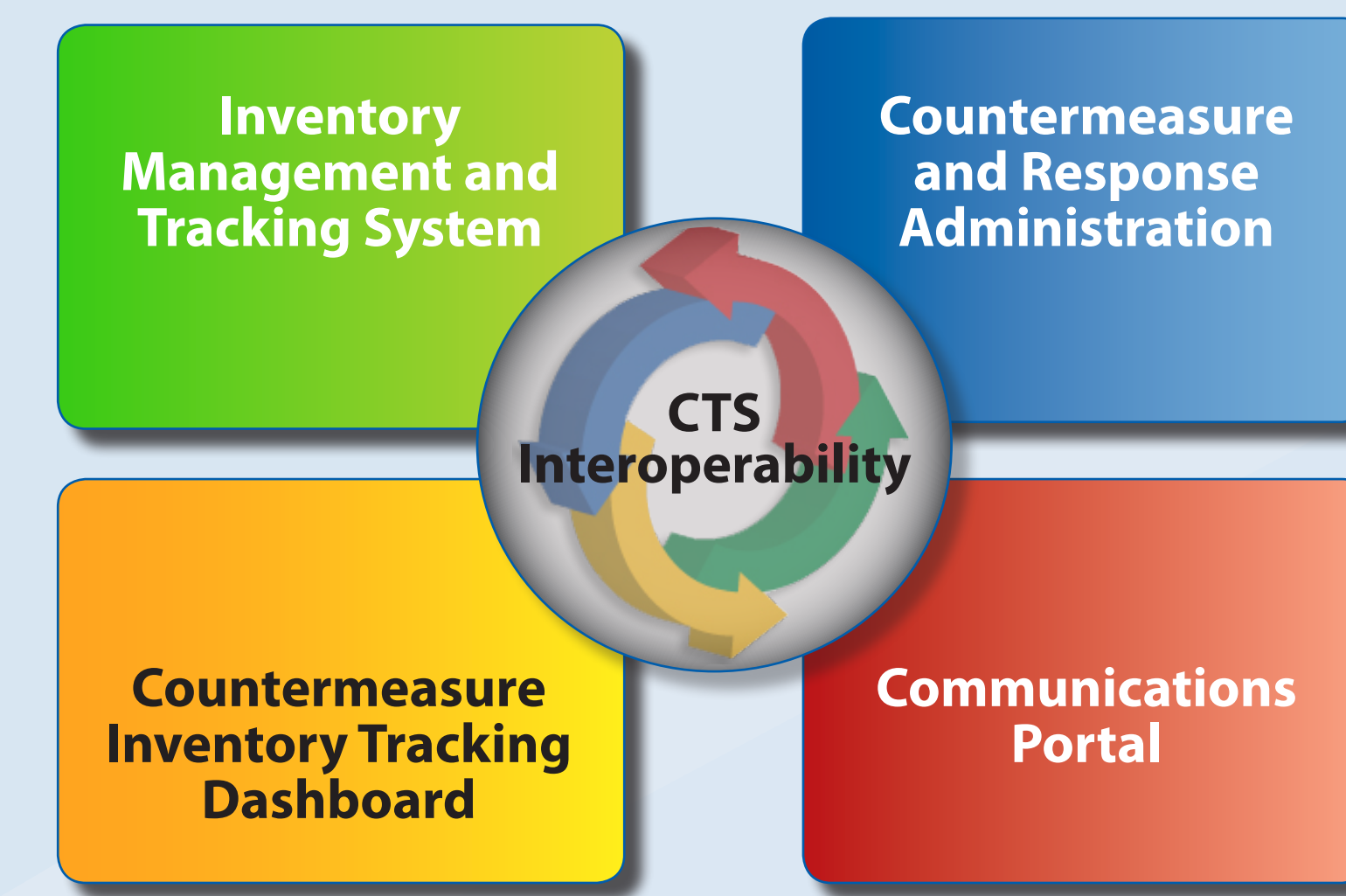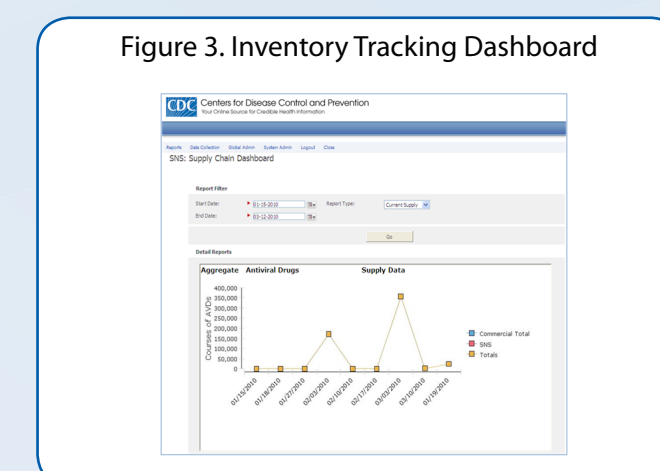
Inventory Management and Tracking System

- The vision for the CTS IMATS is to increase the capacity of the public health system to track and manage inventory of medical and non-medical countermeasures during daily operations or an emergency response event. The IMATS solution will be capable of:
  - Maintaining visibility of inventory, i.e. what is available and on-hand at all levels (state, regional, local and/or point of delivery),
  - Identifying point of delivery facilities where product is shipped (i.e. hospitals, county health departments etc.),
  - Determining how much of the product is used/dispensed at the point of delivery location.
- CDC collaborated with state and local partners to gather business and technical requirements for the development of IMATS, which was released in September 2011. Together, the work group identified and developed system features mapping to nine business processes (Figure 1).
- This system will provide public health providers with a tool to track medical countermeasure inventory during an event down to the local level, report data to CDC, and facilitate warehouse operations including receiving, staging, and storing of inventory (Figure 2).
- IMATS will have data exchange functionality to allow public health providers with existing inventory systems to continue to use their own systems to electronically report data to CDC.
- State and local jurisdictions are offered the opportunity to evaluate IMATS prior to making a decision to adopt the system for their organization.
- As of early February 2012, a total of 99 jurisdictions (24 states, 74 localities, 1 island territory) have expressed interest in evaluating the system. Of these, 79 jurisdictions have completed or are currently completing an evaluation of IMATS. A total of 21 jurisdictions (9 states, 12 localities) have adopted IMATS for their organization as their primary or backup system, one of which is a statewide implementation of IMATS.

Figure 1. IMATS Business Process and Features

Figure 2. Inventory Management and Tracking System

Countermeasure Inventory Tracking Dashboard

- Also referred to as the Countermeasure Supply Chain Dashboard, this tool is used by DSNS to construct a nationwide inventory supply picture (Figure 3).
- The primary purpose of the CIT Dashboard is to assist federal and state officials with decision-making for the release of stockpiled assets.
  - Provides graphic visualization of the overall supply chain, including data on production, current supplies, and ability for manufacturers and distributors to meet current demand.
  - Provides key information on countermeasure availability to meet demands in the near future (available supply) and in the long term (production).

Figure 3. Inventory Tracking Dashboard

Inventory Management and Tracking System

Countermeasure and Response Administration

CTS Interoperability

Countermeasure Inventory Tracking Dashboard

Communications Portal

CTS Interoperability

- During an all-hazards response, CTS will consolidate data from the commercial drug sector, state and local inventory, the point of delivery level, and individual dispensing to create a more complete inventory supply picture that provides situational awareness and extends the visibility of the inventory.
- All four system components have a similar "look and feel" and use the same security mechanism that allows a seamless transition between systems, enhancing ease of use and support of just-in-time training.
- Data exchange capabilities within CRA and IMATS will allow existing registries and inventory management systems to easily transmit data to CDC.
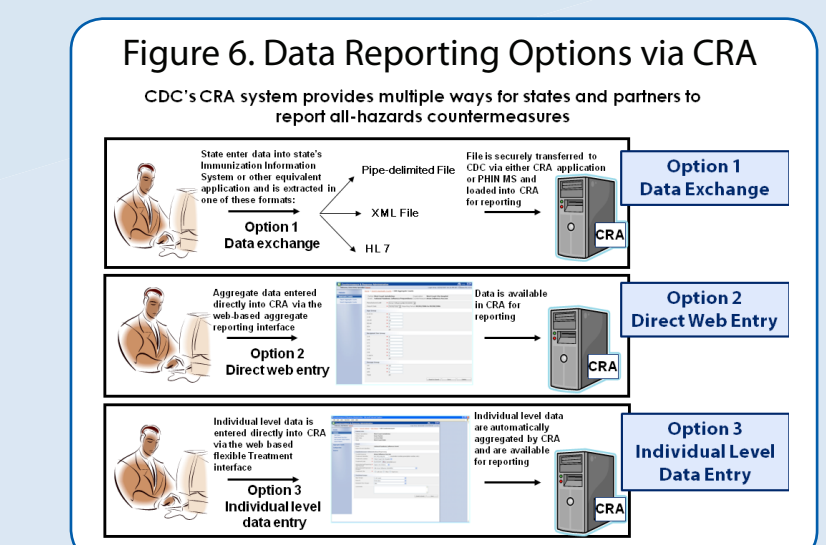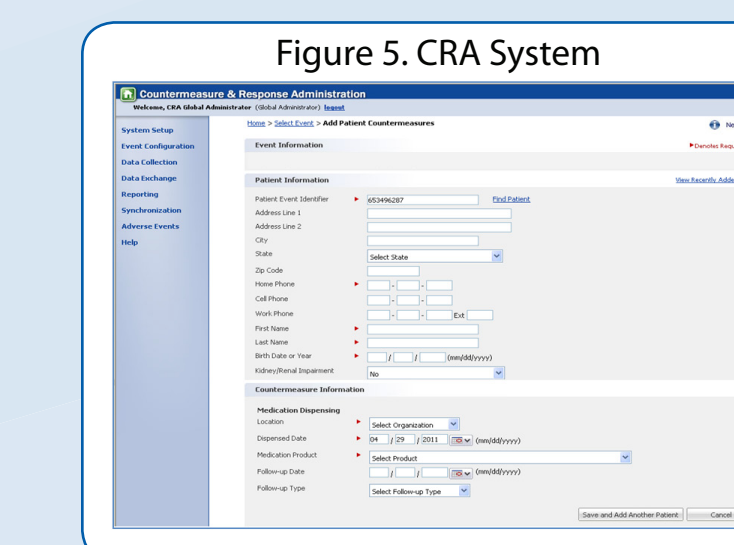
Communications Portal

- The Communications Portal is a content management system which consolidates important up-to-date event response information in one place ensuring timely and efficient communication during an emergency event (Figure 4).
- The portal will include the following key features for public health providers:
  - Horizontal and vertical content sharing across and within organizations
  - Publishing of announcements & alerts
    - Emergency Use Authorization (EUA) and Investigational New Drug (IND) information
    - Lot recalls
  - Document management
  - Management of users within organizations

Figure 4. Communications Portal
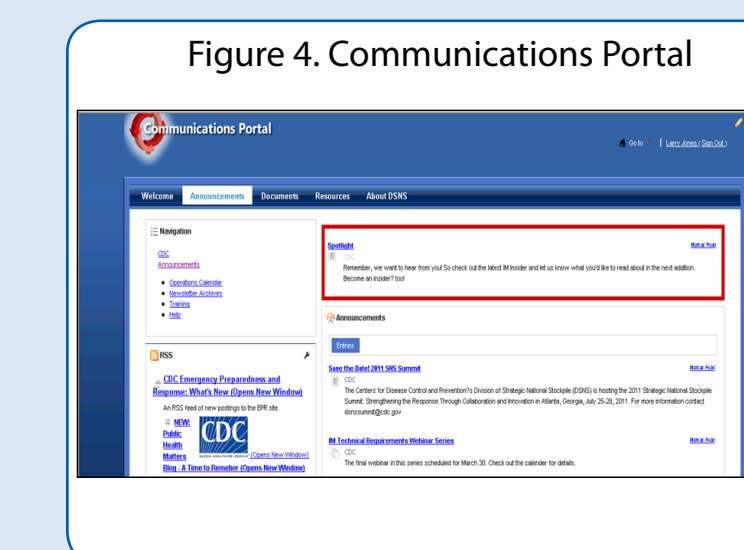
Countermeasure and Response Administration

- CRA is an emergency preparedness and response asset useful for any event involving tracking of vaccine administration, dispensing of pharmaceuticals and medical materiel, or implementation of social distancing measures (Figure 5).
- CRA has its genesis in the Pre-Event Vaccination System (PVS) for the national smallpox vaccination campaign. The system supports both detail and aggregate counts of countermeasures during an event, and has evolved over time to support an all-hazards response.
- CDC has collaborated with the 62 project areas* in preparedness and response activities to ensure CRA is adaptable to support various scenarios and events.
- CRA is a flexible all-hazards system that:
  - Reduces the need for development of new applications each time there is a new event.
  - Supports the analysis of safety, coverage, and effectiveness during an event which improves patient outcomes.
  - Allows for data exchange with existing state registry systems.
- CRA has been utilized for:
  - Tracking vaccine and antivirals administered during H1N1 and pandemic influenza exercises.
  - Community mitigation measures during a pandemic influenza exercise.
  - Tracking antibiotic dispensing during an anthrax exercise.
- The CRA application is designed to provide project areas the flexibility to transmit individual and aggregate data to CDC via one of three reporting options (Figure 6).

Figure 5. CRA System

Figure 6. Data Reporting Options via CRA

Office of Surveillance, Epidemiology, and Laboratory Services

Public Health Informatics and Technology Program Office