Using a Mobile App to Improve Pertussis Vaccination Data Quality and Reporting to an IIS

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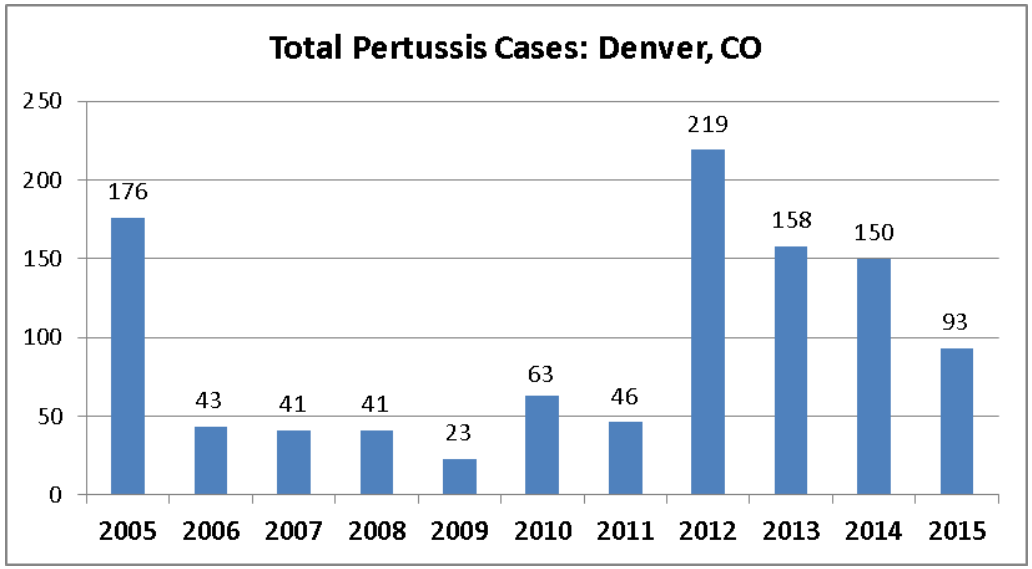
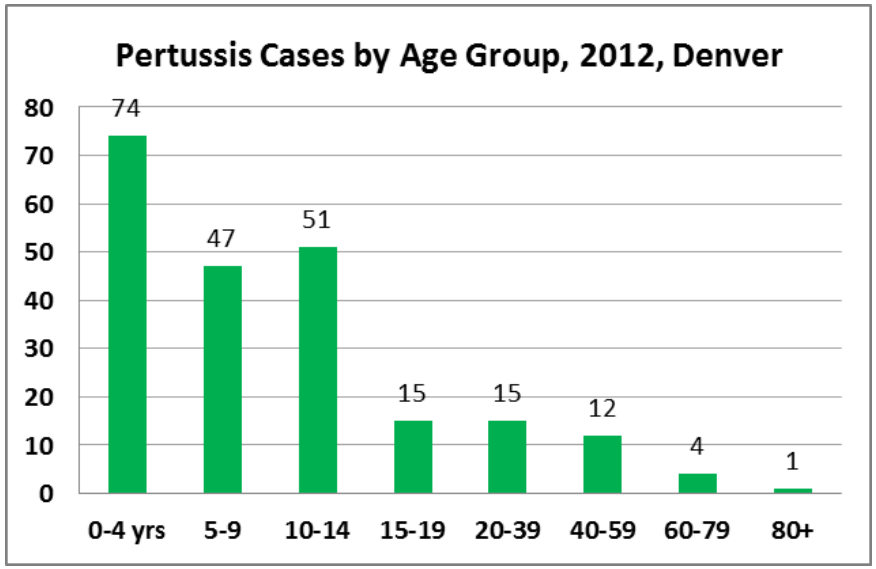
Introduction

- Colorado – Population 5,355,866 (2014)
- CO IIS (CIIS) received 2,588,703 vaccine reports in 2014
- Denver - Population 663,862 (2014)
- Denver Health
  - Integrated healthcare provider serving 25% of Denver's population
- Denver Public Health
  - Epidemiology and Preparedness
  - Clinic, school, community, travel immunization services
  - Provides ~22,000 immunizations/year

Background





- Multi-pronged response to elevated pertussis case reports
- Primary goal = minimize morbidity and prevent mortality, particularly infants < 1 year

Background

- Targeted efforts to vaccinate childcare workers (CCWs) at their worksite
- Use mobile app to collect data at point of service
- Declaration of pertussis epidemic allowed local public health to offer Section 317 Immunization Program vaccines at no cost to all people at risk, regardless of insurance status

Background - HANDI

- Hand-held Automated Notification for Drugs and Immunizations (HANDI)
  - iOS mobile app
  - Web-based administration tool (HANDIMan)
  - Server-based database
- Utilizes barcode/magnetic stripe scanning technology through use of “sled”
- Mobile printer
- Security
  - AES-256 encryption
  - Mobile Device Manager (Good Technology)

HANDI Workflow and Interfaces

Internet Registration*

PHEWR

Online

- Enter demographic data, phone, email, insurance
- Select clinic site, date, time
- Answer event-related health questions

Print ticket with unique barcode

* Developed by the Larimer County Department of Health and Environment

HANDI Application

(iPhone or iPod touch equipped with barcode/magnetic stripe scanner)

Station 1

Registration

- Scan driver's license
- Collect phone #, insurance information
- Add children

Print sticker with unique barcode

Station 2

- Scan sticker or ticket
- Determine vaccine/drug eligibility

Station 3

- Scan sticker or ticket
- Administer vaccine or dispense drugs
- Record vaccinator, lot # and injection site

Print patient specific information

HANDI Server

HANDIMan

Manage clinics/events

- Location, date, time
- Users
- Vaccine/drug information

Data management

- Aggregate data from stations
- Send data to repositories

Secure Data Repository

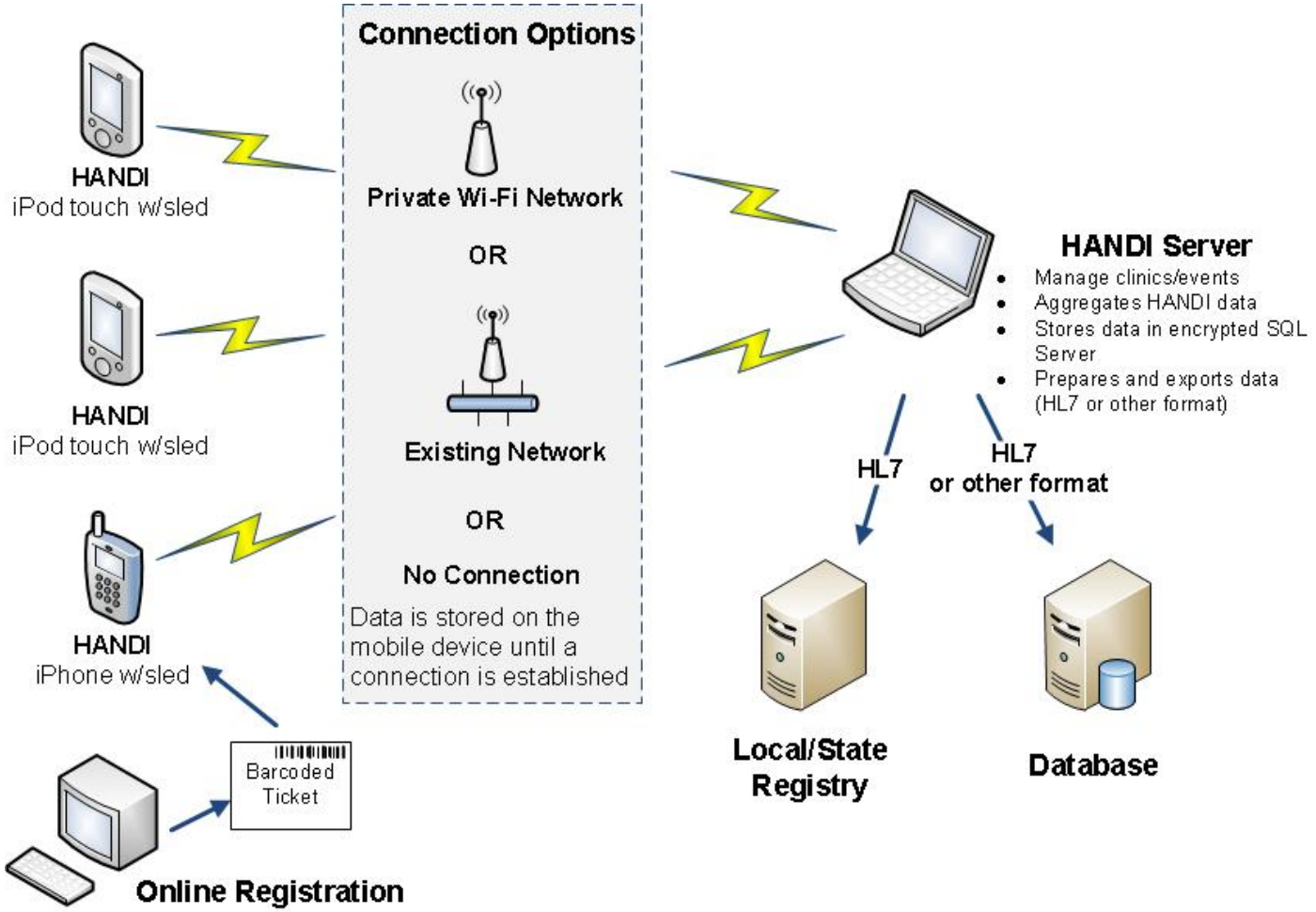
Update immunization registry (local and/or state)

- Upload patient data to existing registry (HL7)

Update designated repository

- Export patient data to existing database

HANDI Network Environments



HANDI and IIS Functional Standards

- Supports Programmatic Goals
  1. Support point of immunization, regardless of setting
  3. Maintain data quality
  4. Preserve the integrity, security, privacy
  6. Promote vaccine safety
- Captures Core Data Elements
  - Scans demographic (n=9), vaccine (n=5) data fields
  - Provides ability to capture unlimited fields in variety of formats

HANDI in the Field

- DH Employee Influenza Campaign, Fall 2012-2015 (2015 n=6,384)
- Community Health Fairs
- Mini-Sentinel Medical Countermeasure project
- DPH, NACCHO Point of Dispensing (POD) exercises
- TB testing, conference registration
- MI Clinic
  - DH ED patient ID/insurance card retention
  - Organ donor registration

Methods

- Surveyed licensed CCWs to gauge interest in Tdap vaccine
  - Workplace vaccination most effective way to reach CCWs
- Nurse vaccinators traveled to Denver childcare sites
- Used HANDI to collect pertussis vaccination data
  - Scanned driver's licenses or other state-issued IDs
  - Entered Tdap vaccination-related eligibility and contraindication information and captured vaccination data (e.g., vaccine lot number and injection site)

Methods

- Encrypted data stored on HANDI devices until outreach workers returned to DPH
- Data securely transferred via Wi-Fi to HANDI server
- HANDIMan converted data to HL7 messages (v2.3.1)
- Records transported to the Colorado IIS (CIIS) using established DH protocols
  - Batch, FTP
  - Sent test file, confirmed receipt, tweaked HL7

Results

- November 2012 - March 2013, DPH provided 405 Tdap doses to CCWs at work or meeting sites
- All CCW Tdap vaccination data were successfully converted to HL7 and transferred to CIIS
- Usability was rated high by end-users trained specifically for this campaign
  - Just-in-time training
  - HANDI user guide

Results - Data Quality

- Accuracy – scanned demographic data
- Completeness – auto-populated, mandatory fields
- Timeliness – data sent within month of campaign conclusion, but potential for real-time or same day transfer to CIIS
- Documentation - CCW specific proof of vaccination provided

Lessons Learned

- HL7 issues, questions
  - MSH sending application field = “HANDI”
  - RXA administered at location = ? DPH? Assigned new code
  - Occupation – "child care worker" (concept codes 39-9010 and 39-9011 from the SOC code set in PHIN VADS)
- Complexity of mobile device management and security
- Importance of good relationship with software vendor
- Users without previous mobile device experience would benefit from more time using HANDI

Update

- Expanded HANDI data model
- Ability to scan 2D vaccine barcodes
- Integration with Mirth for HL7 message creation
- Capability to send IIS message directly from device
- Use of device camera for scanning, image capture
- Electronic signature consent
- Next Steps
  - Dashboard
  - Cloud-based server

Conclusions

- Accommodated CCW work location and schedules through HANDI's mobility
- Eliminated paper-based data collection and subsequent manual data entry
- Supported efficient and accurate reporting of pertussis vaccination to CIIS through standardized data capture and message format
- Streamlines vaccination documentation and reporting, and improves IIS data quality especially for mass and non-routine events

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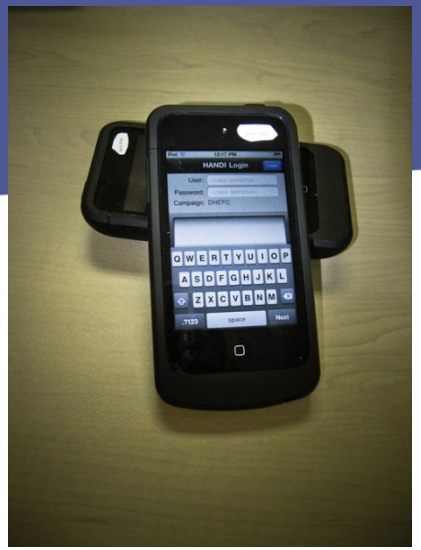

NACCHO Model Practices

LHD of the Year Award presented by NACCHO

Thank you!

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