Public Health Impact of VTrckS ExIS Implementation

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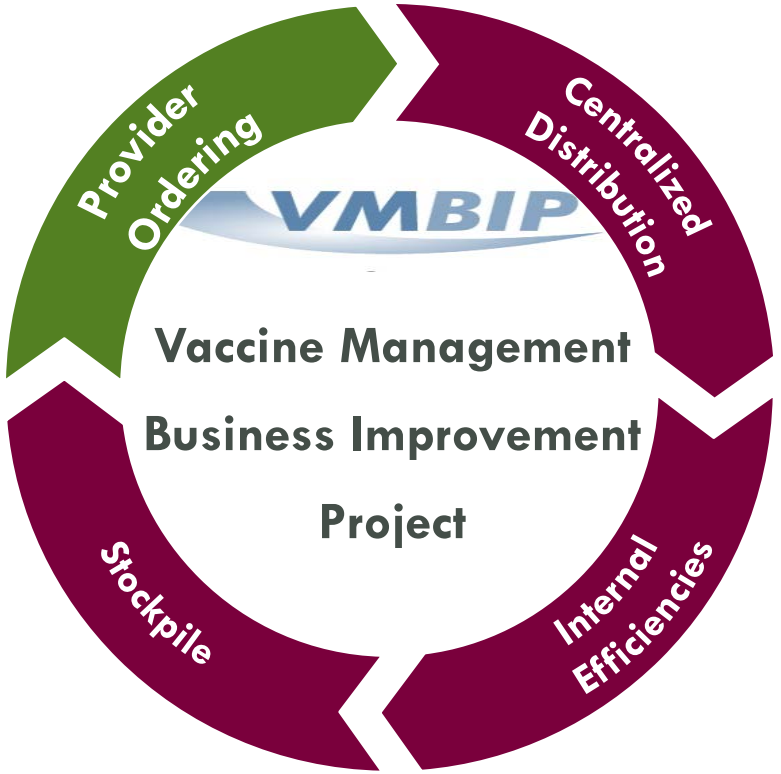
Vaccine Tracking System (VTrckS) Overview

- CDC's national vaccine ordering and inventory management system for publicly purchased vaccine
- An integrated system that supports end-to-end vaccine management
- Manages CDC's vaccine purchase contracts, state vaccine budgets and spend plans
- Visibility into inventory and order status
- Improved operational efficiency and controls

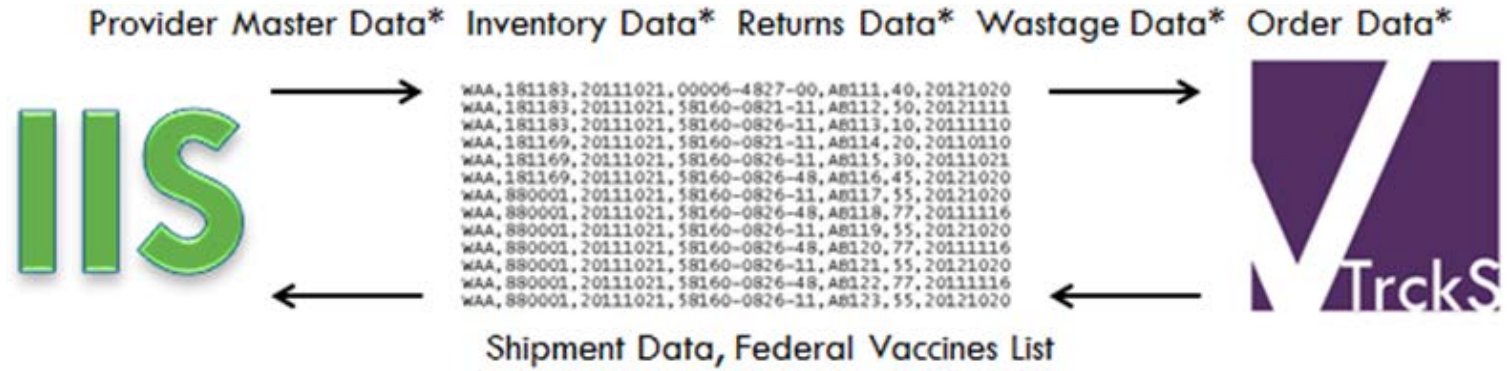


What is an ExIS?

- An external information system (ExIS) is an electronic system that captures and stores vaccine inventory and order information
  - Most awardees use their Immunization Information System (IIS)
- Use of an ExIS eliminates redundancies in maintaining user permissions, training, and data entry
  - Allows provider users to interact with a single system, the ExIS, to track inventory and order vaccine

VTrckS ExIS Data Exchange

- 5 interfaces support data upload to VTrckS



- 2 interfaces support data downloaded from VTrckS

- Some ExIS awardees did not initially implement all file upload interfaces

Funding for ExIS Enhancements

- PPHF11
  - Award Amount – $14,173,842
  - # of Awardees – 27
  - Current Status – Complete
- PPHF12
  - Award Amount – $2,632,953
  - # of Awardees – 5
  - Current Status – Complete
- PPHF14
  - Award Amount – $13,504,533
  - # of Awardees – 24
  - Current Status – 7 projects complete; 17 in progress

ExIS Awardees by Platform

Envision (8)

- Arkansas
- Colorado
- Delaware
- Kansas
- Kentucky
- Nevada
- New Mexico
- Philadelphia

STC (11)

- Alaska
- Arizona
- Indiana
- Louisiana
- Mississippi
- New Hampshire
- Ohio
- Tennessee
- Washington
- West Virginia
- Wyoming

WIR (17)

- California
- Georgia
- Hawaii
- Idaho
- Iowa
- Maine
- Maryland
- Minnesota
- Montana
- Nebraska
- New York State
- North Carolina
- Oregon
- Puerto Rico
- Texas
- Virginia
- Wisconsin

Other (16)

- Chicago
- Florida
- Illinois
- Massachusetts
- Michigan
- Missouri
- New Jersey
- New York City
- North Dakota
- Oklahoma
- Pennsylvania
- Rhode Island
- South Carolina
- South Dakota
- Utah
- Vermont

$ Accountability

- Reductions in lost or expired vaccine

Use of ExIS increased accountability with providers and their vaccines; less vaccine is being lost.

- Improved inventory monitoring, storage, handling

We are seeing improvements in patient level vaccine accountability, the ability to identify inventory problems, increased monitoring of storage and handling, and increased awareness of storage and handling requirements.

Efficiency

- Reduced time to process and receive orders

We enhanced vaccine accountability by importing the shipment data file, which cut down on manual entry and customization of lot numbers.

- Less manual data entry

Since providers now order online, vaccine delivery time has been reduced from up to 6 weeks to 7-10 days.

Provider Satisfaction

- Increased user friendliness

> Because we emphasized usability in our ExIS design, our providers are especially pleased with the user-friendly nature of the ordering tool.

- Improved ease of use

> Providers are finding order entry a lot easier and are excited about the process.

Purpose of VTrckS ExIS Evaluation

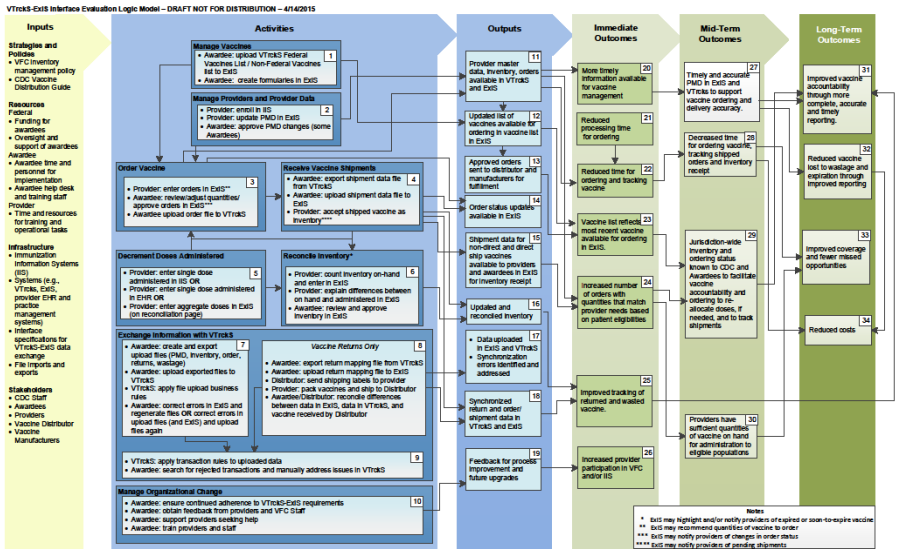
- To determine the impact of VTrckS ExIS interfaces to stakeholders when compared to legacy ordering systems
  - Including important factors influencing impact, actual costs, perceived benefits and challenges to successful implementation
  - Assess provider satisfaction, attitudes and options of the ExIS implementation experience from the end user

VTrckS ExIS Evaluation Design

- Conducted a background assessment and federal stakeholder interviews
- Reviewed existing data sources and gap analysis of data
- Case Study Design
  - Exploration of state-specific experiences
  - Awardee and provider interviews
  - Combination of qualitative and quantitative data

VTrckS ExIS Logic Model

- Complex, multi-dimensional logic model using the CDC evaluation framework
  - Identified key desired outcomes
  - Source of awardee interview questions
  - Guided overall evaluation design



Evaluation Methods

- Conducted pilot case study (NYC)
- Reviewed and revised interview guide and methods based on results from the pilot
- Conducted Awardee and provider interviews
  - Interviewed VFC Coordinator, IIS Manager, and other relevant staff
  - Accountability, efficiency, satisfaction
  - Assessed responses with 5 point Likert (-2 to 2) scale rating

Evaluation Data Collection

- Participation in the case study evaluation included 4.5 hours of staff time and 1 hour of provider time from each awardee participant
  - 1.5 hour interview of the VFC Coordinator,
  - 1.5 hour interview of the IIS manager,
  - 1.5 hours of staff time to collect cost information
  - 0.5 hour interview with two providers from the awardees jurisdiction
- Collection of cost metrics and vaccine ordering cost for each awardee

Awardee Questionnaire Design

- Sample awardee interview questions included:
  - **Accountability** - (Compared to your legacy ordering system) would you say the ability to track vaccines from order to distribution and use is: Much Better, Slightly Better, About the Same, Slightly Worse, Much Worse
  - **Efficiency**- Compared to your legacy ordering system, has the time between a provider submitting an order and receiving vaccine: Strong increase, Slight increase, No increase or decrease, Slight decrease, Strong decrease
  - **Satisfaction**- Compared to before implementation, would you say you have been: Much More Satisfied, Slightly More Satisfied, About the Same, Slightly More Dissatisfied, Much More Dissatisfied

Factors for Sample Selection

Variable	Main/ Sub	Definition
Implementation Timing	Main	Early= Pre May 2013 Late= Post May 2013
Interfaces implemented	Main	Minimum = 2 interfaces implemented Moderate =4 or 5 interfaces implemented Full = 7 interfaces implemented
Size	Sub	Number of records Number of providers Number of orders
Funding status	Sub	PPHF = 0 years (maybe 1 case study) PPHF = 1 year PPHF = 2 years
Geographic region	Sub	East, Central, West
IIS Vendor	Sub	Do they work with an IIS vendor? Y/N Select awardees with different vendors

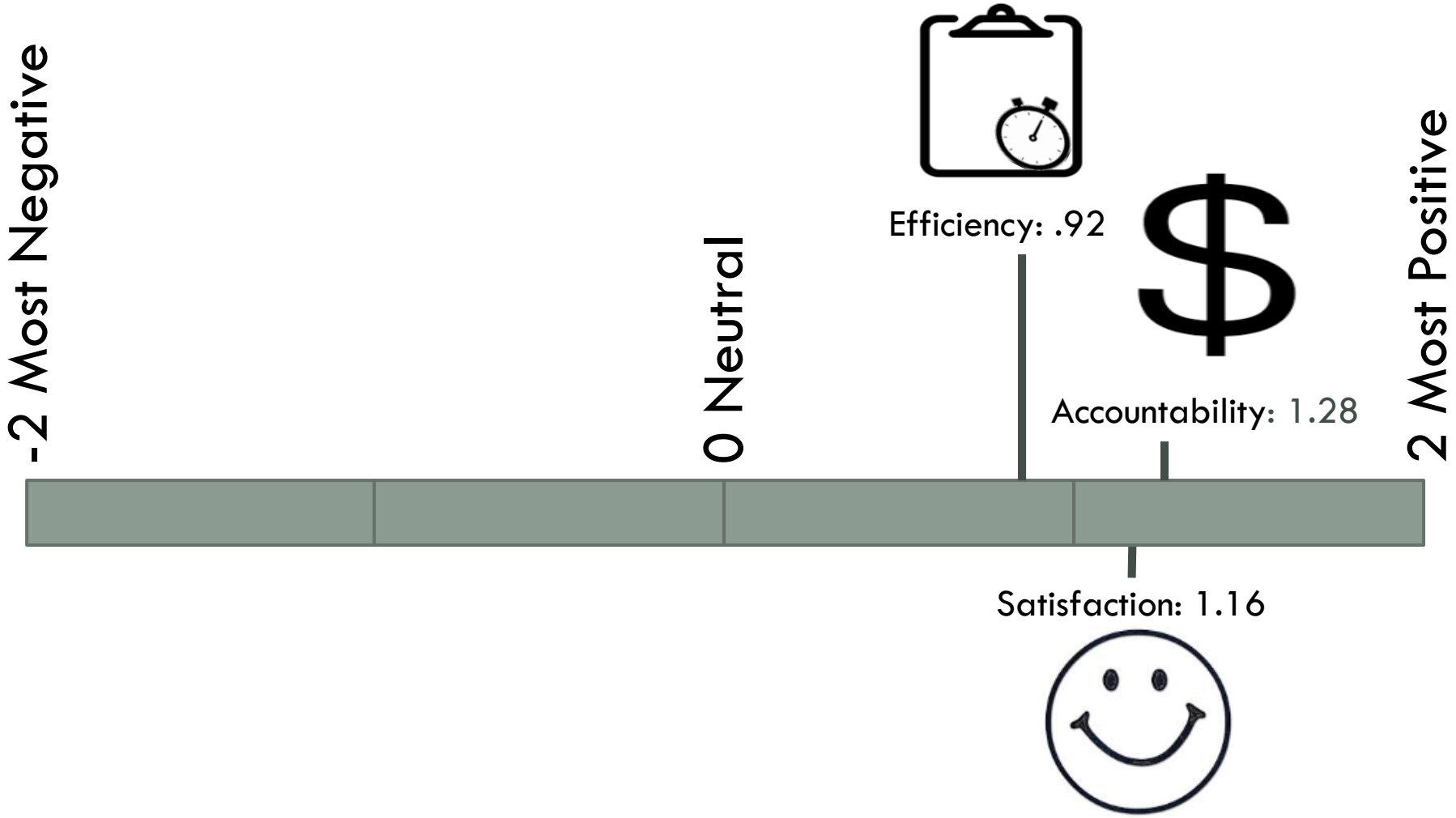
Awardee Sample

- Arizona
- Colorado
- Florida
- Iowa
- Kentucky
- New York City (Pilot Site)
- North Carolina
- Nebraska
- New Jersey
- Oregon
- Washington
- Wisconsin

Final Cost Metrics

Measure	$ Amount
Capital Costs (Fixed , one-time expenses to purchase equipment to render service	
Property purchase/upgrade/renovation	
Hardware purchased/upgraded	
Software purchased/upgraded	
Staff Costs (Sum of salaries and benefits based on one year period)	
Revenue Costs (Non-capitalized expenditures	
External IT support / services	
External clinical support/services	
Training costs	
Overhead Costs (Support and maintenance)	
Institutional indirect/fixed costs (Heating, electricity, general service)	
Relevant travel expenses	
Other Expenses	
Total Costs	

Awardee Results



Awardee Results: Improvements

- Across sites, awardees reported the following major improvements post ExIS implementation
  - 83% reported increased ordering accuracy
  - 66% reported increased order processing efficiency
  - 77% reported time savings
  - 76% reported increased accountability
  - 78% reported improved vaccine delivery

Awardee Results: Challenges

- Across sites, awardees reported the following as challenges to implementation:
  - 62% reported difficulty navigating the learning curve of new system functionality implementation
  - 23% reported difficulty obtaining reports
  - 15% reported difficulty with data clean up
  - 46% reported challenges with ExIS roll-out
    - Provider access to new system
    - Gradual vs. Immediate

Awardee Results: Cost Relationship?

No relationship found between cost of implementation and:

- Number of interfaces implemented
- PPHF Status
- Vendor

No relationship found between accountability, efficiency, and satisfactions scores and:

- Number of interfaces implemented
- PPHF funding status
- Staff cost

Future Cost Analysis

- No direct relationship found between the factors selected and cost expended
- Future analysis of ExIS cost implications may include factors such as:
  - Cost of staff hours saved by transitioning to ExIS
  - Cost of order errors/wastage pre/post implementation
  - Cost of system maintenance pre/post implementation

Provider Interviews

- Brief (30 minute) telephone interview 13 providers of varying roles (e.g. Vaccine Coordinator, LPN, Immunization Program Director)
- Document provider experiences with vaccine ordering and inventory
  - Background
  - Satisfaction
  - Accountability
  - Efficiency
- Results reported in aggregate

Provider Results

- Providers described major improvements as time savings, reduced ordering mistakes, increased accountability, and increased ability to track vaccine status.
  - 77% reported a decrease in time to order vaccine
  - 77% indicated making fewer calls to their immunization office for assistance (order correction, processing difficulties, etc.)
  - 92% reported ordering in ExIS as being “much easier” when compared to tracking vaccine ordering status and inventory using their legacy systems

Contributors

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Thank You!

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.