



Inventory Management Operations of Immunization Information Systems (IIS)

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MIROW: Helping IIS Keep Pace with Evolving Health Initiatives and Technology

In 2005, the American Immunization Registry Association (AIRA) formed the **Modeling of Immunization Registry Operations Work Group (MIROW)** to identify areas for improvement in IIS operations and develop best practice recommendations. MIROW regularly assembles work groups of subject matter experts from the immunization information system (IIS) community to examine, discuss and develop consensus-based best practices for IIS operations.

Policies and regulations related to ordering, distributing, and managing publicly-funded vaccines have evolved rapidly over the past few years, as have technical implementations of capabilities to support those functions. These changes have led to requirements for immunization programs to use Immunization Information Systems (IIS) to provide better visibility into vaccine supply and improved accountability for its use. This trend is apparent in the Vaccines for Children (VFC) program's new requirements that grantee immunization programs adapt to use National Drug Codes (NDC), lot numbers, and dose-level reporting for inventory management operations. Roll-out of the new VTckS public vaccine ordering system, which replaces the existing VACMAN system, creates additional challenges for the IIS community.

Fortunately, IIS are well-positioned to support immunization programs of Centers for Disease Control and Prevention (CDC) grantees to meet VFC program requirements and adapt to the evolving technical landscape. In addition, integrating vaccine management practices within an IIS to meet the VFC requirements will reduce the work of provider organizations and partners in meeting their accountability and reporting requirements.

This mini-guide highlights the best practice recommendations developed by MIROW for IIS inventory management functionality that can assist providers and the VFC and grantee immunization programs in meeting these challenges. In particular, the best practice recommendations relate to IIS inventory management functionality and operations, reports, borrowing between public and private vaccine stocks, and approaches for deriving the National Drug Code (NDC) for an administered dose of vaccine.

To read the complete best practice recommendations, download Immunization Information System Inventory Management Operations from the MIROW web site at: <http://www.immregistries.org/resources/aira-mirow>.



Benefits of Adopting the Best Practice Recommendations

- ✓ Encourages VFC and grantee immunization programs to use IIS to support their needs.
- ✓ Provides agreed upon standard practices for inventory management using an IIS that can be applied when developing IIS applications and electronic health record (EHR) systems.
- ✓ Reduces the reporting burden on providers because their reporting to the IIS meets the requirement for them to provide inventory data to grantee and VFC programs.
- ✓ Improves inventory data quality and accountability for the VFC and grantee immunization programs.
- ✓ Standardizes inventory management practices across all grantee immunization programs and provider organizations.

Highlights of Recommendations

The work group developed key **principles** (P), **business rules** (BR), **general recommendations** (GR) and **reports** related to inventory management through IIS. In addition, the work group provided considerations and developed recommendations for providers related to capturing NDC codes when administering vaccines and borrowing vaccine between private and public stocks.

Principles

Principles developed by the group provide high-level direction for inventory management through IIS, and also guide the development of the more specific business rules (BR).

EXAMPLES OF PRINCIPLES INCLUDE:

NDC supremacy principle: Vaccine inventory management should be based on the National Drug Code (NDC) (P701). 04).

Dose-lot number accountability principle: Every vaccine dose should be accounted for with the associated lot number information (P702).

Completeness principle: The inventory management information submitted to an IIS must contain the minimum/mandatory set of data items in order to be accepted by the IIS (P703).

Accurate accounting principle: Provider organization's physical inventory should be accurately reflected in the IIS (P704)

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Business Rules

Based on these principles, the work group developed business rules (BR) that represent specific requirements and decision-making logic for various aspects of IIS processes for inventory management.

EXAMPLES OF BUSINESS RULES INCLUDE:

A lot number for every vaccine dose administered must be documented and reported by the provider organization to the IIS (BR704).

The lot number for every vaccine dose utilized by a provider organization must be matched/mapped to NDC for a specific inventory entry, and a transaction should be created to adjust the inventory appropriately (BR702).

Minimum set of data items for every vaccine dose: For every vaccine dose, the minimum/mandatory set of data items recorded and reported to the IIS for the purposes of inventory management should include lot number (to be matched/mapped to NDC), lot number expiration date, patient eligibility status (for administered vaccines), provider organization responsible for the inventory, and public/private inventory indicator (optional) (BR711).

Reconciliation frequency: Provider organizations should reconcile their entire physical inventory to the IIS at least once a month; large, complex provider organizations may consider reconciling more frequently (e.g., weekly) to minimize the risk of inventory errors (BR723). Provider Organizations must reconcile their entire physical inventory to the IIS inventory immediately prior to ordering (BR722).

For an EHR submission for an opt-out patient, IIS should decrement inventory without updating the patient record (BR720).

When a multi-dose vial is involved, borrowing should be done at the single-dose level (BR725).



General Recommendations

Along with business rules that provide specific process-related requirements, the workgroup made general recommendations (GR) for IIS inventory management functionality and operations.

EXAMPLES OF GENERAL RECOMMENDATIONS ARE:

Manual data entry should be minimized and manual entry of inventory data that is already known should be avoided (GR710). 719).

IIS inventory management functionality should support accountability at the dose/lot number level, but aggregate reporters (provider organizations) will have to be accommodated during the phase-in of accountability at the dose/lot number level for all provider organizations (GR702).

Data quality assurance metrics (as determined by CDC and grantee immunization programs) should be utilized to measure and track data quality from any shipping entity, including a centralized distributor (currently McKesson); for example, entering lot numbers and other data items. These metrics should be used to improve data quality from any shipping entity (GR717).

IIS application should have reports available to support detailed analysis by the grantee program of provider organization practices (GR

Reports

The workgroup also developed recommendations for reports related to vaccine inventory management. The following paragraphs give examples of some of these reports.

ACCOUNTABILITY REPORTS TO SUPPORT INVENTORY MANAGEMENT

The Vaccine Loss report helps identify the highest areas of vaccine loss by showing a key accountability metric: the percentage of vaccine loss based on total doses ordered versus total doses administered or accounted for. The report, which should be run after lot numbers have been reconciled, shows grantees and provider organizations this metric at the provider organization, county and jurisdiction levels. In addition, the report meets the CDC policy requirement outlined in Chapter 2 of IPOM: Immunization Program Operations Manual that “Vaccine loss and waste should be minimized and measured.” (www.cdc.gov/vaccines/vac-gen/policies/ipom)

Reconciliation Reports

The Borrowed/Replaced report enables provider organizations and the VFC program to track loans and repayments of vaccines within a provider organization between private and public stocks. Such tracking ensures that loans between the two sources of vaccine stock are repaid in a timely manner.

Accountability Reports for Ordering

To ensure that shipments complete and are received by the provider organization, the Pending Shipments report tracks vaccines shipped but not yet accepted. More specifically, it displays orders of publicly-funded vaccines that are shipped, but that have not yet been received into inventory by the provider organization.

This report helps the grantee program determine if the time the provider organization takes to complete the transaction is exceeding an established threshold. It can also determine if the number of not completed shipments for a provider organization exceeds an established threshold. Finally, the report reminds provider organizations that shipments are pending their receipt, prompting them to accept the shipment and complete the transaction.

Allocation Reports

Some reports are generated on an as-needed, or on-demand basis—for example, the Vaccine Lot Recall Patient report. This report can be used to follow up with patients who have received a recalled product by helping grantee immunization programs and provider organizations identify patients who have received vaccines from a specific lot number.

Please, refer to the CDC website www.cdc.gov/vaccines for most current policies of the Vaccines for Children (VFC) program regarding vaccine borrowing and other inventory management aspects.

Case Study: Solving a Vaccine Borrowing Issue in Michigan

This case study explains how the Michigan IIS and the state’s provider organizations address a common issue related to borrowing and replacement of vaccine between public and private stocks.

In Michigan, a provider organization assesses a patient and determines that he is covered by private health insurance and therefore non-VFC-eligible. The provider organization then administers a vaccine dose from its private stock to the patient and bills the patient’s health insurance. The insurance company subsequently rejects payment for the vaccine, which results in the patient being under-insured.

The Michigan IIS lets the provider change the patient’s eligibility from “insured” to “underinsured” for the dose for which the insurance company rejected payment. This change triggers the origination of a borrowing transaction and indicates that the public inventory owes a dose of public vaccine to the private inventory. The IIS deducts the borrowed dose from public inventory using a “Replaced Borrow” transaction, and then adds it back into the private stock using a “Transfer In - Replaced Borrow” transaction.

By simply changing the patient’s status from insured to under-insured, the IIS replaces the borrowed vaccine from the private stock with public stock.



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NDC Considerations

According to the VFC program and VTrckS system requirements, vaccine inventory must be reported based on NDC. However, with the exception of some pharmacy chains that administer vaccines, when a provider organization administers a vaccine to a patient, it typically does not capture the NDC directly. Therefore, data items recorded for immunization tracking purposes should be mapped and converted by the IIS to the respective NDC in order to be used for inventory tracking purposes.

The guidelines also discuss assumptions about NDC and lot numbers, while acknowledging that exceptions to these assumptions do occur and create issues. The workgroup developed recommendations for ways to address these issues.

Leveraging IIS to Meet New Demands for Vaccine Inventory Management

This mini-guide provides practical explanations and information related to using IIS as a foundational tool for handling inventory management activities. These activities support the needs of provider organizations, the VFC program and grantee immunization programs by providing vaccine inventory information for ordering, logging received shipments, logging inventory transactions, conducting inventory reconciliation, and providing reports. By reviewing and appropriately following the guidelines, IIS can also better align their practices through adherence to a set of common recommendations and guidelines.

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