RESOURCE AND PATIENT MANAGEMENT SYSTEM

Immunization Interface Management

(BYIM)

Technical Manual

Version 2.0 Patch 8
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Office of Information Technology
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Preface

This manual contains the complete technical programming information related to the updates to this version of the Indian Health Service Resource and Patient Management System Immunization Interface Management system.

1.0 Introduction

Immunization Interface Management (namespace BYIM), also known as Immunization Data Exchange, allows a two-way exchange of immunization data between facilities running the Resource and Patient Management System (RPMS) and state immunization registries. Immunization Interface Management Menu (IIMM) uses secured data exchange via secure Internet protocols to meet Health Insurance Portability and Accountability Act (HIPAA) data security requirements for exchange of information between Indian Health Service (IHS) and Tribal facilities and state registries.

Version 2.0 patch 8 provides several technical fixes and HL7 (Health Level 7) message enhancements to meet ongoing Meaningful Use 2 (MU2) and National Institute of Standards and Technology (NIST) requirements and various state specific message requirements.

This manual provides IHS site managers with a technical description of the IZ system routines, files, menus, and other information required to effectively manage the system and information specific to patch 8.

All routines, options, and keys are namespaced starting with the letters BYIM.

2.0   Implementation and Maintenance

2.1   General Information

The IIMM system resides in the BYIM namespace, and all related options, security keys, routines, and globals are name-spaced BYIM.

2.2   System Requirements

- Kernel (namespace XU) v8.0 or later

- FileMan (namespace DI) v22 or higher with latest patches

- IHS PCC Suite v2.0 with latest patches

- IHS/VA Utilities (namespace XB/ZIB) v3.0 with latest patches

- IHS Patient Dictionaries (namespace AUPN) v99.1 patch 17

- Patient Information Management System (namespace PIMS) v5.3 with latest patches

- Generic Interface (namespace GIS) v3.0 with latest patches

- IHS Immunization System (namespace BI) v8.5 with latest patches

- For sites with the ability to transmit immunization data to/from their state immunization registry automatically, the Simple Message Mover software.

> **Note**:   The site must have an account with their state immunization registry for secure transfer of the immunization data to the state.

2.3   Security Keys

These are the IIMM security keys:

Table 1 IIMM Security Keys

Key Name	Description
BYIMZMENU	Controls access to the primary menu option.
BYIMZ IZ EXPORT	Controls access to the immunization export function.
BYIMZ SET PARAMETERS	Controls access to the option to set parameters for the Immunization Data Exchange.

Key Name	Description
BYIMZ IZ AUTO IMPORT	Controls access to the automatic import function for the automated import of immunizations from the state registry.
BYIM IZ TEST EXPORT	Controls access to the option to create an initial small immunization data export file, to test the data exchange process.

3.0   BYIM Menu

These are the IIMM menu options:

- IZDE   Start Immunization Data Export
- IZS   Check Immunization Data Export Status
- IZIM   Import Immunizations from State Registry
- IZAD   Add Immunizations from State Registry
- EXP   Show Immunizations Exported for a Patient
- IZFS   File Statistics Report
- NO   Children for whom there is no match in RPMS
- TEST   Create TEST Export File
- SET   Immunization Data Exchange Parameters
- SET   SET UP Immunization Data Exchange Parameters
- ADD   Define Additional Data Exchange Sites
- IIS   Add/Edit IIS Assigned Vaccine Inventory Codes
- REL   Review and Edit BYIM RELATIONSHIP Table Codes

4.0   Routines

These are the IIMM routines and their descriptions:

Table 2 IIMM Routines

Routine	Description
BYIMIMM	Manages primary data export, import, and review functions
BYIMIMM1	Extension of BYIMIMM
BYIMIMM2	Extension of BYIMIMM
BYIMIMM3	Extension of BYIMIMM
BYIMIMM4	Extension of BYIMIMM
BYIMIMM5	Extension of BYIMIMM
BYIMIMM6	Extension of BYIMIMM
BYIMSEGS	Controls HL7 segment creation
BYIMSEG1	Extension of BYIMSEGS
BYIMMU2	Setup for MU2 testing
BYIMMU21	Extension of BYIMMU2
BYIMRT	Extension of BYIMmu2
BYIMXIS	Controls device handling
BYIMPORT	Used to control the GIS import for initial setup
BYIMNTEG	Routine integrity check
BYIMD	Utility Routine

5.0   Files and Tables

Table 3 Files and Tables

File #	Global	Filename	Description
90480	^BYIMPARA(	IZ PARAMETERS	Contains setup parameters.
90480.1	^BYIMEXP(	IZ EXPORTS	Contains a log of all immunizations exported to the state registry from RPMS.
90480.2	^BYIMRT(	IZ REAL-TIME QUERY	Contains structure for real-time HL7 message exchange.
90480.3	^BYIMTP(	IZ TRANSPORT FILES	Contains transport files for RT data exchange.
90480.4	^BYIMOBX(	IZ OBX SEGMENTS	Structure for specialized OBX segments.
90480.5	^BYIMNOS(	IZ NOS TABLE	Cross walk for NOS immunizations.
90480.6	^BYIMREL(	IZ RELATIONSHIP TABLE	Contains database for HL7 relationship cross references.
90480.7	^BYIMCDC(	IZ CDC RELATIONSHIP CODES	Contains database of CDC relationship codes.
90480.8	^BYIMCON(	IZ CONTRAINDICATION CODES	Contains immunization contraindication codes.

5.1   File Access

Not applicable.

5.2   Cross References

Table 4 Cross References within BYIM

File #	Filename	Field #	Field Name	Cross Reference
90480	IZ PARAMETERS	.01	SITE NAME	B
90480	IZ PARAMETERS	2	IMPORTED FILE	FILE
90480	IZ PARAMETERS	2 Sub Field .02	DATE OF IMPORT/EXPORT	DATE
90480	IZ PARAMETERS	4 Sub Field .01	NO MATCH NAME	NMNAME
90480	IZ PARAMETERS	4 Sub Field .02	DOB	NMDOB
90480	IZ PARAMETERS	4 Sub Field .03	IMPORT DATE	NMDATE
90480	IZ PARAMETERS	5 Sub Field .02	STATE IIS FACILITY CODE	RXA
90480.1	IZ EXPORTS	.01	NAME	B
90480.1	IZ EXPORTS	.02	EXPORT DATE	C
90480.1	IZ EXPORTS	.02	EXPORT DATE	AC
90480.1	IZ EXPORTS	.03	V IMMUNIZATION	D

File #	Filename	Field #	Field Name	Cross Reference
90480.1	IZ EXPORTS	.04	EXPORT OR IMPORT	DT00
90480.5	IZ NOS TABLE	.01	IMMUNIZATION	B
90480.6	IZ RELATIONSHIP MAPPING	.01	RELATIONSHIP	B
90480.7	IZ CDC RELATIONSHIP CODES	.01	CDC HL7 TABLE 0063 CODE	B
90480.7	IZ CDC RELATIONSHIP CODES	.02	CDC RELATIONSHIP DESCRIPTION	C
90480.8	IZ CONTRAINDICAT ION CODES	.01	VACCINE	B

6.0   Internal Relations

There are no interactive RPMS Server Menus for this package. Users do not need access to the appropriate options and keys.

7.0   **External Relations**

7.1   External Calls

There are no RPMS interactive programmer calls to this package.

7.2   Callable Routines

Table 5 Callable Routines

Routine Called	Invoked by
ENV^BYIMIMM	Installation process
DE^BYIMIMM	Option IZDE Start Immunization Data Export
DATE^BYIMIMM	Option BYIM IZ AUTO EXPORT
DEX^BYIMIMM	SEL^BYIMIMM3 TEST^BYIMIMM3
HFSA^BYIMIMM	Export creation process
HFSARES^BYIMIMM	Export processing
READY^BYIMIMM	Option BYIM IZ READY
EOJ^BYIMIMM	To kill export process variables
PATH^BYIMIMM	Routines BYIMIMM1 and BYIMIMM2
MPORT^BYIMIMM	Used by the package installation process
MENU^BYIMIMM	Called by multiple BYIM options
RESTART^BYIMIMM	Called within the BYIMIMM routine
ADDEX^BYIMIMM	Called within the BYIMIMM routine
PATH^BYIMIMM	Called by BYIM* routines
NOPATH^BYIMIMM	Called by BYIM* routines
PAUSE^BYIMIMM	Called by BYIM* routines
FN^BYIMIMM	Called by BYIM* routines
IMPORT^BYIMIMM1	Option IZIM Import Immunizations from State Registry
I1^BYIMIMM1	Called by routine BYIMIMM2
IN^BYIMIMM1	Internal call
SET^BYIMIMM1	Internal call
SET1^BYIMIMM1	Internal call
DEL^BYIMIMM1	Called from the BYIM DEL STATE IMMUNIZATIONS protocol
ADD^BYIMIMM1	Function to add immunizations from the state registry to RPMS.
FMINIT^BYIMIMM1	Called by lister to create list of kids and immunizations to list for display.
HDR^BYIMIMM1	Called by lister to create header for immunization list display.
START^BYIMIMM1	Called by lister to start immunization list display.
VALM^BYIMM1	Called by lister to control immunization list display.

Routine Called	Invoked by
PARAM^BYIMIMM1	Called from BYIM SET PARAMETERS option
PADD^BYIMIMM1	Called from within the BYIMIMM1 routine
ADDIM^BYIMIMM1	Internal call
MATCH^BYIMIMM2	Called from routine BYIMIMM1
NN^BYIMIMM2	Called by option BYIM IZ NO MATCH LIST
NONAME^BYIMIMM2	Called by no name report
AUTOIMP^BYIMIMM2	Called by option BYIM IZ AUTO IMPORT
FLIP^BYIMIMM2	Called by the package installation process
SHOW^BYIMIMM2	Called by the option BYIM IZ SHOW EXPORT
SDISP^BYIMIMM2	Called by report to display immunizations exported
SHEAD^BYIMIMM2	Called by report to display immunizations exported
INSET^BYIMIMM2	Called from routine BYIMIMM1
KILL^BYIMIMM2	Called from routine BYIMIMM1
P2^BYIMIMM2	Called by KIDS build
P3^BYIMIMM2	Called by KIDS build
P4^BYIMIMM2	Called by KIDS build
P5^BYIMIMM2	Called by KIDS build
P6^BYIMIMM2	Called by KIDS build
P7^BYIMIMM2	Called by KIDS build
P8^BYIMIMM2	Called by KIDS build
V3^BYIMIMM2	Called by KIDS build
SELECT^BYIMIMM3	Called by option BYIM IZ FILE STATISTICS REPORT
DISP^BYIMIMM3	Called from routine BYIMIMM3
OL^BYIMIMM3	Called from routine BYIMIMM3
HX1^BYIMIMM3	Called from GIS HL7 message
HX2^BYIMIMM3	Called from GIS HL7 message
VFC^BYIMIMM3	Called from GIS HL7 message
VFCD^BYIMIMM3	Called from GIS HL7 message
IVFC^BYIMIMM3	Called from routine BYIMSEG1
IVFCD^BYIMIMM3	Internal call
IVFCP^BYIMIMM3	Internal call
VT^BYIMIMM3	Internal call
IVT^BYIMIMM3	Internal call
HRN^BYIMIMM3	Called from routine BYIMSEGS
RACE^BYIMIMM3	Called from routine BYIMSEGS
ETH^BYIMIMM3	Called from routine BYIMSEGS
TEST^BYIMIMM3	Called by option BYIM IZ TEST EXPORT FILE
IZV04^BYIMIMM3	Internal call

Routine Called	Invoked by
RSP^BYIMIMM3	Internal call
LOC^BYIMIMM3	Called from routine BYIMIMM2
PROT^BYIMIMM3	Called from routine BYIMSEGS
PROTDT^BYIMIMM3	Called from routine BYIMSEGS
ACTDT^BYIMIMM3	Called from routine BYIMSEGS
PUB^BYIMIMM3	Called from routine BYIMSEGS
PUBDT^BYIMIMM3	Called from routine BYIMSEGS
IVFS^BYIMIMM3	Called from routine BYIMSEG1
DIRECT^BYIMIMM3	Called from routine BYIMIMM1
SEL^BYIMIMM3	Called from routine BYIMIMM5
MULT^BYIMIMM4	Internal call
ASITE^BYIMIMM4	Called by option BYIM IZ ADDITIONAL SITES
CP^BYIMIMM4	Internal call
IMMDUP^BYIMIMM4	Internal call
DEXIT^BYIMIMM4	Internal call
ALOT^BYIMIMM4	Internal call
ILOT^BYIMIMM4	Internal call
LV^BYIMIMM4	Internal call
MAN^BYIMIMM4	Internal call
LOT^BYIMIMM4	Called from routine BYIMIMM1
LOG^BYIMIMM4	Called from routines BYIMIMM and BYIMIMM1
BULLETIN^BYIMIMM4	Internal call
EXPBULL^BYIMIMM4	Called from routine BYIMRT
QPATH^BYIMIMM4	Internal call
LOGDFN^BYIMIMM4	Internal call
LOGD^BYIMIMM4	Called from routine BYIMRT
HFSA^BYIMIMM4	Called from routine BYIMIMM
LP^BYIMIMM4	Internal call
BRIDGE^BYIMIMM5	Called by option BYIM IZ BRIDGE MONITOR
STAT^BYIMIMM5	Internal call
RXA^BYIMIMM5	Called by option BYIM IZ INVENTORY CONTROL CODE
TEST^BYIMIMM5	Called by routine BYIMIMM3
CLEAN^BYIMIMM5	Called by routine BYMIMM
COMSPEC^BYIMIMM5	Internal call
CDISP^BYIMIMM5	Internal call
CAS^BYIMIMM5	Internal call
CSEL^BYIMIMM5	Internal call
MENU^BYIMIMM6	Called by multiple options
ADDLOT^BYIMIMM6	Called by routine BYMIMM1

Routine Called	Invoked by
SCRN^BYIMIMM6	Called by routine BYIMIMM2
HFSA^BYIMIMM6	Called by routine BYMIMM
RLSH^BYIMIMM6	Called by option BYIM IZ RELATIONSHIP EDIT
RUPD^BYIMIMM6	Internal call
RDISPLAY^BYIMIMM6	Internal call
REDIT^BYIMIMM6	Internal call
PATH^BYIMIMM6	Called by multiple routines
NOPATH^BYIMIMM6	Called by multiple routines
PAUSE^BYIMIMM6	Called by multiple routines
OBXCE^BYIMSEG1	Called by GIS process
OBXPR^BYIMSEG1	Called by GIS process
OBXPB^BYIMSEG1	Called by GIS process
REFUSAL^BYIMSEG1	Called by routine BYIMIMM4
R1^BYIMSEG1	Internal call
V1^BYIMSEG1	Internal call
COMP^BYIMSEG1	Internal call
OBXTY^BYIMSEG1	Called by GIS process
QRF^BYIMSEG1	Called by GIS process
FHS^BYIMSEG1	Called by GIS process
OBXFS^BYIMSEG1	Called by GIS process
RXR^BYIMSEG1	Called by routine BYIMSEGS
MSH^BYIMSEGS	Called by GIS process
PID^BYIMSEGS	Called by GIS process
PD1^BYIMSEGS	Called by GIS process
PV1^BYIMSEGS	Called by GIS process
ORC^BYIMSEGS	Called by GIS process
RXA^BYIMSEGS	Called by GIS process
RXR^BYIMSEGS	Called by GIS process
QRD^BYIMSEGS	Called by GIS process
FHS^BYIMSEGS	Called by GIS process
ZIS^BYIMXIS	Called by multiple routines
ZIS1^BYIMXIS	Internal call
CLOSE^BYIMXIS	Internal call
ZTLOAD^BYIMXIS	Internal call
OPEN^BYIMXIS	Internal call
HOST^BYIMXIS	Internal call
BROWSE^BYIMXIS	Called by routine BYIMIMM2

7.3   Published Entry Points

There are no documented entry points.

7.4   Exported Options

There are no Interactive RPMS Server Menus.

7.5   Remote Procedure Calls

There are no remote procedure calls.

8.0   Archiving and Purging

There is no archiving and purging for this package.

9.0   Documentation Resources

9.1   System Documentation

Online VPS system documentation can be generated through the use of several Kernel options, including (but not limited to) the following:

- XINDEX
- VA FileMan
- Data Dictionary Utilities
- List File Attributes

For more option listings and further information about other utilities that supply online technical information, see the Decentralized Hospital Computer Program Kernel Reference manual.

9.1.1   Index (XINDEX)

The XINDEX kernel option analyzes the structure of a routine to determine, in part, if the routine adheres to RPMS programming standards. The output can include the following components:

- Compiled list of errors and warnings
- Routine listing
- Local variables
- Global variables
- Naked globals
- Label references
- External references

Running XINDEX for a specified set of routines allows users to discover any deviations from RPMS programming standards that exist, and to see how routines interact with one another (i.e., which routines call or are called by other routines).

To run XINDEX for the VPS system, at the "Routine(s)?" prompt, type the BYIM namespace.

9.1.2   List File Attributes

Not Applicable.

9.1.3   Inquire Option

Not Applicable.

9.1.4   Print File Option

Not Applicable.

9.2   RPMS Online Help

In addition to system documentation, RPMS includes special help displays for most menu options and data entry prompts. Typing a question mark (**?**) at the "Select . . . Option" prompt displays information related to the current option, where:

Table 6 RPMS Online Help Queries

Typing . . .	Displays . . .
A single question mark (?)	A list of all options accessible from the current option.
Two question marks (??)	A list of all accessible options and their formal names.
Three question marks (???)	A brief description for each option in a menu.
A single question mark (?) Followed by an option name (?option)	Extended help, if available, for that option.

10.0   SAC Requirements/Exemptions

There are no exemptions to the SAC standards for this version.

Glossary

Archiving

The storing of historical or little-used data off-line (often on tape).

Banner

A line of text with a user's name and domain.

Callable Entry Points

Locations in a routine that can be called from an application program.

Caret (^)

A circumflex, also known as a "hat," that is used as a delimiter in a global. The up-hat is denoted as "^" and is typed by pressing Shift+6 on the keyboard.

Cross-reference

An indexing method in which files can include pre-sorted lists of entries as part of the stored database. Cross-references (x-refs) facilitate look-up and reporting.

Entry Point

Entry point within a routine that is referenced by a "DO" or "GOTO" command from a routine internal to a package.

Event Type

A message that is sent which signifies a particular event on the system (e.g., admit, discharge, etc.).

File

A set of related records or entries treated as a single unit.

FileMan

The database management system for RPMS.

Global

In MUMPS, global refers to a variable stored on disk (global variable) or the array to which the global variable may belong (global array).

Health Level 7

The generally accepted standard for the exchange of specified types of medical information between applications. HL7 is both the name of the standards developing organization and the collection of protocols that the organization has developed and published. For more information, refer to the HL7 Web site: www.hl7.org.

INDEX (%INDEX)

A Kernel utility used to verify routines and other MUMPS code associated with a package. Checking is done according to current ANSI MUMPS standards and RPMS programming standards. This tool can be invoked through an option or from direct mode (>D ^%INDEX).

Information Resource Management

The IHS personnel responsible for information systems management and security.

Init

Initialization of an application package. The initialization step in the installation process builds files from a set of routines (the init routines). Init is a shortened form of initialization.

Internal Entry Number

The number used to identify an entry within a file. Every record has a unique Internal Entry Number.

Kernel

The set of MUMPS software utilities that function as an intermediary between the host operating system and application packages, such as Laboratory and Pharmacy. The Kernel provides a standard and consistent user and programmer interface between application packages and the underlying MUMPS implementation. These utilities provide the foundation for RPMS.

Menu

A list of choices for computing activity. A menu is a type of option designed to identify a series of items (other options) for presentation to the user for selection. When displayed, menu-type options are preceded by the word "Select" and followed by the word "option" as in "Select Menu Management option:" (the menu's select prompt).

Namespace

A unique set of two to four alphabetic characters that are assigned by the database administrator to a software application.

Option

An entry in the Option file. As an item on a menu, an option provides an opportunity for users to select it, thereby invoking the associated computing activity. Options may also be scheduled to run in the background, non-interactively, by TaskMan.

Routine

A program or sequence of instructions called by a program that may have some general or frequent use. MUMPS routines are groups of program lines that are saved, loaded, and called as a single unit via a specific name.

Segment

A group of elements (also known as data fields) in an HL7 message that have been defined as logically belonging to the same category. Each segment contains a three-character Segment ID, the elements, administrative information (if applicable to that segment type), and designated delimiters between each element.

User Class Identification

A computing area.

Utility

A callable routine line tag or function; a universal routine usable by anyone.

Variable

A character or group of characters that refers to a value. MUMPS recognizes three types of variables: local variables, global variables, and special variables. Local variables exist in a partition of the main memory and disappear at sign-off. A global variable is stored on disk, potentially available to any user. Global variables usually exist as parts of global arrays.

Acronym List

Acronym	Meaning
BYIM	Namespace for this component
CDC	Centers for Disease Control and Prevention
DOB	Date of Birth
GIS	Generic Interface
HIPAA	Heath Insurance Portability and Accountability Act
HL7	Health Level 7
IDE	Immunization Data Exchange
IHS	Indian Health Service
IIMM	Immunization Interface Management Menu
IIS	Internet Information Services
KIDS	Kernel Installation and Distribution System
MU2	Meaningful Use 2
MUMPS	Massachusetts General Hospital (M) Utility Multi-Programming System
NIST	National Institute of Standards and Technology
NOS	Not Otherwise Specified
PCC	Patient Care Component
PIMS	Patient Information Management System
RPMS	Resource and Patient Management System
SAC	Standards and Conventions
SMM	Simple Message Mover
VPS	Volume Performance Standard

Contact Information

If you have any questions or comments regarding this distribution, please contact the OIT Help Desk (IHS).

Phone: (888) 830-7280 (toll free)

Web: http://www.ihs.gov/helpdesk/

Email: support@ihs.gov