Covid-19 Vaccination Programme

Document History	
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Version History

Date	Version	Authors	Change
15/12/2020	0.1	Babasola Olukoya, Karen Wynne	First draft
05/01/2021	0.2	Karen Wynne	Included data points based on IBM dataset

1. Document Aim

This specification describes the structure, format and meaning of the information in Vaccination Report messages from the IBM/SalesForce system to GP practice software management systems. The messages are sent via the Healthlink National messaging broker. Messages are in Health Level Seven (HL7) version 2.4 format with Extensible Markup Language (XML) encoding, in conformance with the Health Information and Quality Authority (HIQA) GP Messaging Standard.

References:

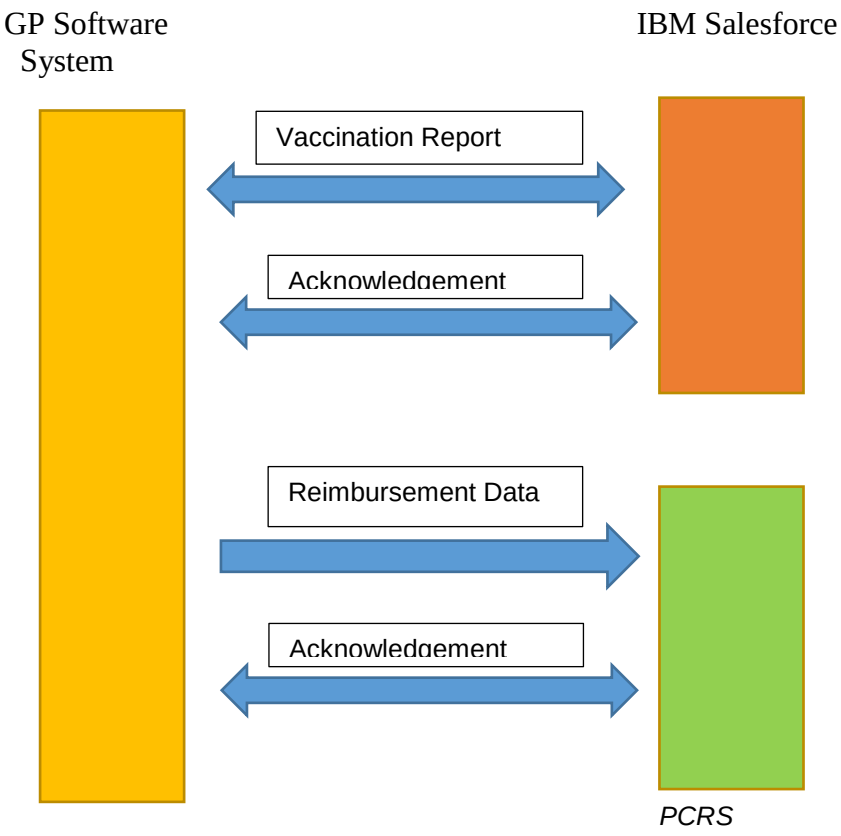
Caristix HL7-Definition V2 reference site: Caristix HL7-Definition V2 Home (HL7 v2.4)

2. Scope

The first phase of the programme targets Covid Vaccination reports from Sales Force system to GPs via Healthlink.

3. Message Flow

For each vaccination visit a vaccination report is created and sent as a VXU_V04 message. An acknowledgement message (ACK) is returned to the sending system.



4. Message Type

When a provider wishes to update the patient's vaccination record being held in a registry, he will transmit an unsolicited update of the record (a V04 trigger event).

SEGMENT	OPTIONALITY	REPEATABILITY
MSH - Message Header	R	-
PID - Patient identification	R	-
PD1 - Patient Additional Demographic	O	-
NK1 - Next of kin / associated parties	O	∞
PATIENT	O	-
PV1 - Patient visit	R	-
PV2 - Patient visit - additional information	O	-
GT1 - Guarantor	O	∞
INSURANCE	O	∞
ORDER	O	∞
ORC - Common Order	O	-
RXA - Pharmacy/Treatment Administration	R	-
RXR - Pharmacy/Treatment Route	O	-
OBSERVATION	O	∞
OBX - Observation/Result	R	-
NTE - Notes and Comments	O	∞

The HL7 v2.4 VXU_V04 message in this implementation uses the following segments.

REF_12	**Patient Discharge**	**HL7 Chapter**
MSH	Message Header	2
PID	Patient Identification	3
PV1	Patient Visit	3
ORC	Common Order	
RXA	Pharmacy/Treatment Administration	6
RXR	Pharmacy/Treatment Route	7
OBX	Observation/ Result	7
NTE	Notes and Comments	

Message Header Segment (MSH)

Field	**Mand**	**Value**	**Comment**	**HL7**
Sending Application	Yes	SALESFORCE.HEALTHLINK.76	This field will contain the identifier indicating the Healthlink Message Type. This field will also contain the generating systems name	<MSH.3>

			and the middleware name preceding the Healthlink message number in accordance with the HeBE standard review as follows	
Sending Facility	Yes		Sending Facility / System	<MSH.4>
Receiving Application	No			<MSH.5>
Receiving Facility	Yes		Receiving Facility/GP	<MSH.6>
Date/time of message	Yes	YYYYMMDDHHMM		<MSH.7>
Message Type	Yes	VXU_V04 (Constant)		<MSH.9>
Message Control ID	Yes	VXU20201227162 05405003564	Uniquely identifies the message. The format used to generate the Message Control ID is "VXU" + date and time in the format YYYYMMDDHHMMSSSS. Note the max length of this field is 50 characters.	<MSH.10 >
Processing ID	Yes	P (Constant)		<MSH.11 >
Version ID	Yes	2.4 (Constant)	HL7 version number	<MSH.12 >
Accept ACK Type	Yes	AL (Constant)	ACK always expected	<MSH.15 >

Patient Identification Segment (PID)

Field	**Mand**	**Value**	**Comment**	**HL7**
Patient Identifier	Yes		Patient identifiers i.e. IHI, PPSN. Covid-19?	<PID.3>
Patient Name	Yes	Varchar(50)	Surname, first name	<PID.5>
Date of Birth	Yes	YYYYMMDD	Min: 19000101 Max: current date	<PID.7>
Gender	Yes	F, M	F for female, M for male	<PID.8>
Address	Yes	Five lines, each line Varchar(30)	Four lines, first two are mandatory Fifth line contains Eircode	<PID.11>
Phone Number			Mobile, landline, email	<PID.13>
Ethnic Group				<PID.22>

Patient Visit Segment (PV1)

Field	**Mand**	**Value**	**Comment**	**HL7**
Patient Class	Yes	O for Outpatient	Required HL7 field, uses HL7 user defined Table 0004	<PV1.2>
Ambulatory		B6 (Pregnant)	HL7 user defined Table 0009	<PV1.15>

Status				

Common Order (ORC)

Field	Mand	Value	Comment	HL7
Order Control	Yes	RE	Order Control Code (HL7 table 00119)	<ORC.1>
Placer Order Number			placer applications order number	<ORC.2>
Filler Order Number			Order number associated with the filling application	<ORC.3>
Placer Group Number				<ORC.4>
Order Status		Coded values	Specifies the status of an order. (HL7 Table 0038 - Order status for valid entries)	<ORC.5>

Pharmacy/Treatment Administration (RXA)

Field	Mand	Value	Comment	HL7
Give sub-id counter	Yes	0	Order Control Code (HL7 table 00119)	<RXA.1>
Administration Sub-ID Counter	Yes	Numeric	starts with 1 the first time that medication/treatment is administered for this order	<RXA.2>
Date/Time Start of Administration	Yes	YYYYMMDD		<RXA.3>
Date/Time End of Administration	Yes	YYYYMMDD		<RXA.4>
Administered Code	Yes	e.g. ‘influenza, whole’	This field contains the identifier of the medical substance/treatment administered. (HL7 Table 0292 - Vaccines administered).	<RXA.5>
Administered Amount	Yes	Numeric		<RXA.6>
Administered Units	Conditional		Required if the administered amount code does not imply units.	<RXA.7>
Administered Dosage Form	No		Use when administered code does not specify the dosage form. It indicates the manner in which the medication/treatment is aggregated for	<RXA.8>

			dispensing, e.g., tablets, capsules, suppositories	
Administration Notes	No		Notes from the provider administering the medication/treatment.	<RXA.9>
Administering Provider	No		Provider ID of the person administering the pharmaceutical/treatment.	<RXA.10>
Administered-at Location	No		The inpatient or outpatient location at which the drug or treatment was administered (if applicable)	<RXA.11>
Administered Per	No	Varchar(20)	Rate at which this medication/treatment was administered as calculated by using RXA-6-administered amount and RXA-7-administered units	<RXA.12>
Administered Strength	No	Numeric	Use when RXA-5-Administered code does not specify the strength. This is the numeric part of the strength, used in combination with RXA-14-Administered strength units.	<RXA.13>
Administered Strength Units	No		This is the unit of the strength, used in combination with RXA-13-Administered strength	<RXA.14>
Substance Lot Number	No	Varchar(20)	Lot number of the medical substance administered.	<RXA.15>
Substance Expiration Date	No	YYYYMMDD		<RXA.16>
Substance Manufacturer Name	No		HL7 Table 0227	<RXA.17>
Substance/Treatment Refusal Reason	No			<RXA.18>
Indication	No			<RXA.19

				>
Completion Status	No	CP, NA, PA, or RE	HL7 Table 0322	<RXA.20 >
Action Code	No	A, D or U	HL7 Table 0323	<RXA.21 >
System Entry Date/Time	No	YYYYMMDDHHMM		<RXA.22 >

Pharmacy/Treatment Route (RXR)

Field	Mand	Value	Comment	HL7
Route	Yes		Route of Administration. (Value from HL7 table 0162). Example – Apply Externally	<RXR.1>
Administration Site	No		Site of the administration route. (HL7 Table 0163 - Body Site). Example Left Arms	<RXR.2>
Administration Device	No		Mechanical device used to aid in the administration. (HL7 Table 0164 - Administration device).	<RXR.3>
Administration Method	No		Specific method requested for the administration of the drug or treatment to the patient. Refer to HL7 Table 0165 - Administration method for valid values	<RXR.4>
Routing Instruction	No		Instruction on administration routing, especially in cases where more than one route of administration is possible	<RXR.5>

Observation Result Segment (OBX)

Field	Mand	Value	Comment	HL7
Set ID	Yes	Numeric	Starts at 1 and incrementally increases, order is not significant	<OBX.1>
Value type	Yes	FT, NM, CE, TS,	FT for formatted text, NM for numeric, CE for coded entry, TS for time stamp	<OBX.2>
Observation identifier	Yes	LOINC code and name for observation result. Local code where LOINC not available	See Codes for OBX Segments e.g. LOINC code for Weight measured in Kg is 3141-9	<OBX.3>

Observation value	Yes		The value of the observation	<OBX.5>
Observation units		Units relevant to result		<OBX.6>
Reference range		Reference range of result		<OBX.7>
Abnormal flag		Abnormal flag value		<OBX.8>
Observation result status	Yes	F (Constant)	F for final	<OBX.11>
Date/time of the observation	Yes	YYYYMMDD	Timestamp	<OBX.14>

Notes and Comments (NTE)

Field	Mand	Value	Comment	HL7
Set ID	No		Sequence ID of the comment where multiple comments apply. Starts at 1	<NTE.1>
Notes and Comments	No	Text		<NTE.3>

Additional Segments

OBX Segment	Mand	Comment	Code Type	Value
Did an adverse reaction occur?			Snomed	?
Adverse Reaction Description				
Duration of reaction				
Treatment provided				
Outcome of reaction				
Relevant Medical History				

5. Acknowledgement Message

When Healthlink receives a message an acknowledgement is returned to the sender.

ACK	General Acknowledgment	Chapter
MSH	Message Header	2
MSA	Message Acknowledgment	2
[ERR]	Error	2

Table 1 Segments for Acknowledgement Message

Below is an XML sample of how an ACK message type is formatted.

```
<?xml version="1.0" encoding="UTF-8"?>
<ACK xmlns="urn:hl7-org:v2xml">
  <MSH>
    <MSH.1>|</MSH.1>
    <MSH.2>^~\&amp;</MSH.2>
    <MSH.3>
```

```
      <HD.1>HLONLINE.HEALTHLINK.13</HD.1>
    </MSH.3>
    <MSH.4>
      <HD.1>HEALTHLINKONLINE</HD.1>
      <HD.2>HLINK</HD.2>
      <HD.3>L</HD.3>
    </MSH.4>
    <MSH.5>
      <HD.1>SALESFORCE</HD.1>
      <HD.2 />
      <HD.3 />
    </MSH.5>
    <MSH.6>
      <HD.1>SALESFORCE </HD.1>
      <HD.2>99994</HD.2>
      <HD.3>L</HD.3>
    </MSH.6>
    <MSH.7>
      <TS.1>20201220162235</TS.1>
    </MSH.7>
    <MSH.9>
      <MSG.1>ACK</MSG.1>
      <MSG.2>I12</MSG.2>
    </MSH.9>
    <MSH.10>ACK202012141622353564</MSH.10>
    <MSH.11>
      <PT.1>P</PT.1>
    </MSH.11>
    <MSH.12>
      <VID.1>2.4</VID.1>
    </MSH.12>
  </MSH>
  <MSA>
    <MSA.1>AA</MSA.1>
    <MSA.2>VXU20201214162054003564</MSA.2>
  </MSA>
</ACK>
```

The values for sending application and sending facility in the acknowledgement message are the same as the values for receiving application and receiving facility in the initiating assessment message and vice versa.

MSH.10 is the unique message control ID of the acknowledgement message and is not related to MSA.2, the message control ID of the assessment message that is being acknowledged. MSH.10 is generated using the format of the current date and time, up to the milliseconds. `Ex: ACKyyyyMMddHHmmssfff`

The three possible values for MSA.1, Acknowledgement Code are:

- AA Application Acknowledgement
- AE Application Error (details/reasons to be provided by PCRS)
- AR Application Reject

This tells you whether the original assessment message, as identified in MSA.2, has been accepted.

An Application Reject acknowledgement may mean one of two things:

- There is a major problem with the message and it cannot be validated by the receiving system;
- There is a problem with the receiving system and it is unable to process the message, though the message itself is fine;

An Application Error message means there is a problem with the content of the message. This should be diagnosed and corrected by the sending system before resending the message.

The Message Error Segment (ERR) is required where an error is found in a HL7 message. The ERR Segment is used to add error information to acknowledgement messages. Healthlink have added codes to the HL7 Table 0357 - Message Error Condition Codes, included in this document. If an error is not included in this table, the unknown code can be used and new errors can be added to this table accordingly as they occur.

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM #	ELEMENT NAME
1	80	CM	R	**Y**		00024	Error Code and Location

Message Error (ERR) Segment

Notes:

- The ERR segment is optional in an ACK message, but where it does appear the ERR.1 field is required.
- The ERR.1 field is repeatable, allowing for information on multiple errors to be displayed.
- The components of the ERR.1 field are:
    - segment ID, the three letter identifier of the segment in which the error occurred;
    - sequence, the Set ID of the segment if there is more than one segment with the same segment ID in the message;
    - field position, the field number within the segment where the error occurred;
    - code identifying error, taken from HL7 table 0357 Message Error Condition Codes and shown in Section 14 of this document.

Consider an example where an ORU_R01 message is missing the required fields PID.3 Patient Identifier and PID.5 Patient Name in the MSH Segment. In this case the ERR segment of the acknowledgment message, which would have AE in the MSA.1 field, would look as follows:

```
<ERR>
        <ERR.1>
                <ELD.1>PID</ELD.1>
                <ELD.3>3</ELD.3>
                <ELD.4>
                        <CE.1>101</CE.1>
                        <CE.2>Required field missing</CE.2>
                        <CE.3>HL70357</CE.3>
                </ELD.4>
        </ERR.1>
        <ERR.1>
                <ELD.1>PID</ELD.1>
                <ELD.3>5</ELD.3>
                <ELD.4>
                        <CE.1>101</CE.1>
                        <CE.2>Required field missing</CE.2>
                        <CE.3>HL70357</CE.3>
```

```
                </ELD.4>
        </ERR.1>
</ERR>
```

For the current list of error codes see HL7 Table 0357 in Code Tables section below.

6. Code Tables

Table 0038 – Order Status

Value	Description
A	Some, but not all, results available
CA	Order was canceled
CM	Order is completed
DC	Order was discontinued
ER	Error, order not found
HD	Order is on hold
IP	In process, unspecified
RP	Order has been replaced
SC	In process, scheduled

Table 0162 – Route of Administration

Value	Description
AP	Apply Externally
B	Buccal
DT	Dental
EP	Epidural
ET	Endotrachial Tube*
GTT	Gastrostomy Tube
GU	GU Irrigant
IA	Intra-arterial
IB	Intrabursal
IC	Intracardiac
ICV	Intracervical (uterus)
ID	Intradermal
IH	Inhalation
IHA	Intrahepatic Artery
IM	Intramuscular
IMR	Immerse (Soak) Body Part
IN	Intranasal
IO	Intraocular
IP	Intraperitoneal
IS	Intrasynovial
IT	Intrathecal
IU	Intrauterine

IV	Intravenous
MM	Mucous Membrane
MTH	Mouth/Throat
NG	Nasogastric
NP	Nasal Prongs*
NS	Nasal
NT	Nasotrachial Tube
OP	Ophthalmic
OT	Otic
OTH	Other/Miscellaneous
PF	Perfusion
PO	Oral
PR	Rectal
RM	Rebreather Mask*
SC	Subcutaneous
SD	Soaked Dressing
SL	Sublingual
TD	Transdermal
TL	Translingual
TP	Topical
TRA	Tracheostomy*
UR	Urethral
VG	Vaginal
VM	Ventimask
WND	Wound

Table 0163 – Body Site

Value	Description
BE	Bilateral Ears
BN	Bilateral Nares
BU	Buttock
CT	Chest Tube
LA	Left Arm
LAC	Left Anterior Chest
LACF	Left Antecubital Fossa
LD	Left Deltoid
LE	Left Ear
LEJ	Left External Jugular
LF	Left Foot
LG	Left Gluteus Medius
LH	Left Hand
LIJ	Left Internal Jugular
LLAQ	Left Lower Abd Quadrant
LLFA	Left Lower Forearm

LMFA	Left Mid Forearm
LN	Left Naris
LPC	Left Posterior Chest
LSC	Left Subclavian
LT	Left Thigh
LUA	Left Upper Arm
LUAQ	Left Upper Abd Quadrant
LUFA	Left Upper Forearm
LVG	Left Ventragluteal
LVL	Left Vastus Lateralis
NB	Nebulized
OD	Right Eye
OS	Left Eye
OU	Bilateral Eyes
PA	Perianal
PERIN	Perineal
RA	Right Arm
RAC	Right Anterior Chest
RACF	Right Antecubital Fossa
RD	Right Deltoid
RE	Right Ear
REJ	Right External Jugular
RF	Right Foot
RG	Right Gluteus Medius
RH	Right Hand
RIJ	Right Internal Jugular
RLAQ	Rt Lower Abd Quadrant
RLFA	Right Lower Forearm
RMFA	Right Mid Forearm
RN	Right Naris
RPC	Right Posterior Chest
RSC	Right Subclavian
RT	Right Thigh
RUA	Right Upper Arm
RUAQ	Right Upper Abd Quadrant
RUFA	Right Upper Forearm
RVG	Right Ventragluteal
RVL	Right Vastus Lateralis

Table 0164 – Administration Device

Value	Description
AP	Applicator
BT	Buretrol
HL	Heparin Lock

IPPB	IPPB
IVP	IV Pump
IVS	IV Soluset
MI	Metered Inhaler
NEB	Nebulizer
PCA	PCA Pump

Table 0357 – Message Error Condition Codes

Error Condition Code	Error Condition Text	Description/Comment
Success		
0	**Message accepted**	Success. Optional, as the AA conveys success. Used for systems that must always return a status code.
Errors		
100	**Segment sequence error**	The message segments were not in the proper order, or required segments are missing.
101	**Required field missing**	A required field is missing from a segment
102	**Data type error**	The field contained data of the wrong data type, e.g. an NM field contained "FOO".
103	**Table value not found**	A field of data type ID or IS was compared against the corresponding table, and no match was found.
Rejection		
200	**Unsupported message type**	The Message Type is not supported.
201	**Unsupported event code**	The Event Code is not supported.
202	**Unsupported processing id**	The Processing ID is not supported.
203	**Unsupported version id**	The Version ID is not supported.
204	**Unknown key identifier**	The ID of the patient, order, etc., was not found. Used for transactions other than additions, e.g. transfer of a non-existent patient.
205	**Duplicate key identifier**	The ID of the patient, order, etc., already exists. Used in response to addition transactions (Admit, New Order, etc.).
206	**Application record locked**	The transaction could not be performed at the application storage level, e.g. database locked.

207	**Application internal error**	A catchall for internal errors not explicitly covered by other codes.
208	**Duplicate Message Filename**	The Filename of the message already exists.
Healthlink Codes		
300	**Invalid XML**	`Message is not valid xml document`
301	**XML Namespace Issue**	`Unknown xml namespace`
302	**Schema Validation error**	`Message cannot be validated against schema`
303	**Invalid data format – MSH.3**	`Invalid data format, segment 'MSH.3/HD.1', expected format '[GeneratingSystem].[Middleware].[MessageType]'`
304	**MSH.9 Message Type Mismatch**	`Xml root (Ex: <ORU_R01>) Messagetype doesn't match with MSH.9 Values.`
305	**Invalid REF/RRI Message Type**	`Invalid data format, segment 'MSH.10', expected format 'REF/RRI[YYYYMMDDHHMMSS][MedicalCouncilNumber]'`
306	**Invalid Hospital Data Format MSH.4 or MSH.6**	`Invalid data format, segment 'MSH.4-MSH.6/HD.2', expected format '[HospitalCode]' and not '[HospitalCode].[SomeOtherCode]'`
307	**Invalid Agency Data Format MSH.4 or MSH.6**	`Invalid data format, segment 'MSH.4-MSH.6/HD.2', expected format '[GPCode/AgencyCode/MCNcode]' and not '[GPCode/AgencyCode/MCNcode].[SomeOtherCode]'`
308	**Invalid MCN.HLPracticeID Data Format MSH.4 or MSH.6**	`Invalid data format, segment 'MSH.4-MSH.6/HD.2', expected format '[MCN.HLPracticeID]'`

Note: As new errors occur, they will be added to this error code table.