Electronic Notifiable Disease Messaging System (ENDMS) Implementation Guide

A guide to creating HL7 messages for direct notification to the ENDMS

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1.1   Overview

Notification is a key part of monitoring and managing communicable disease (and some non-communicable issues) under the current Health Act 1956. Under Schedules 1 and 2 of the Health Act there are 49 diseases and conditions that are required to be notified (including on suspicion) to a medical officer of health.

Section 74AA of the Health Act requires laboratories to directly notify a medical officer of health, based at one of 20 local public health units, on confirmation or suspicion that a patient has a notifiable disease. It is anticipated that the requirement to report on suspicion will no longer be necessary once a review of procedures has been completed.

The primary purpose of notification is to trigger an appropriate public health response so that further illness can be prevented. The secondary purpose is for surveillance; that is, is to predict, observe and minimise the harm caused by outbreak, epidemic and pandemic situations. Accurate and timely data is essential if we are to promptly identify and respond to important public health events such as pandemic influenza, or a similar emergent infectious agent with epidemic or pandemic potential.

1.2   Background

In 2003 the Ministry of Health initiated a review of the current system of notifiable diseases and conditions. This was undertaken by the consultancy group Allen and Clarke. The review identified a need to improve the effectiveness of the current system, especially in relation to data accuracy and timeliness. A major recommendation was to create the legal framework that would allow direct laboratory notification of notifiable diseases.

The Health Amendment Act 2006 was passed in December 2006. As well as improving the government's ability to respond to an outbreak of pandemic flu or a similar highly infectious disease, this new legislation provided for direct laboratory notification (of notifiable diseases). Along with the aim of improving the New Zealand disease surveillance system in terms of its timeliness, quality and accessibility, the problematic nature of relying on the voluntary participation of laboratories to supply data was strong justification for introducing a legal requirement for laboratories to report cases of notifiable diseases.

2 National Electronic Notification System

2.1 Background

In July 2007 the Ministry of Health established a project team and a sector advisory group to help facilitate the introduction of direct laboratory notification. Based on consultation with stakeholders, including regional meetings, an electronic system for reporting notifiable conditions was identified as an option to explore further. The electronic delivery of test results from laboratory to ordering practitioner is well established in New Zealand, but public health services' information capability and the links between public health services and laboratories were not as sophisticated and well established.

A number of other jurisdictions have implemented, or are in the process of implementing, electronic notification systems. New South Wales is a good example, where they have had paper- and phone-based laboratory notification since 1991. A significant amount of work has been done since 2004 as part of the NSW 'eNotification project', including work on notification algorithms (trigger points), standardised message content and structure, and the secure communication of data.

2.2 EpiSurv notifiable disease database

The preferred method of notification, approved by the Direct Laboratory Notification Advisory Group, is through a national electronic system that builds on existing systems, including EpiSurv, the national notifiable diseases database maintained by Environmental Science and Research (ESR).

EpiSurv7, a new web-based real-time version of the national notifiable disease surveillance system, was deployed in April 2007. In May 2007 ESR developed and deployed a prototype contact-tracing module for use with EpiSurv7 for Exercise Cruickshank. EpiSurv7 is currently used by public health services throughout New Zealand, with 150 registered users. The system is extensible and scaleable.

The development and implementation of a national electronic solution for direct laboratory notifications requires a phased approach to ensure the implementation is robust and co-ordinates with other IT projects involving laboratories. This will also ensure there is efficient and effective use of IT resources and systems, and will help to minimise compliance costs for all parties involved.

The national electronic system will provide a base set of functionality and tools, including:
* electronic and manual data capture
* recording of cases of notifiable diseases and subsequent investigation details
* recording of contact tracing information and linking of cases
* data analysis and reporting.

The system is intended to work alongside local public health unit systems, which are used to support more advanced requirements for notifiable disease case management, contact tracing and management, and outbreak and emergency responses. Basically, it provides interfaces through which data can be exchanged electronically.

ESR recently invested in an enhanced, robust and secure information management platform known as SurvINZ. It is on this platform that ESR has integrated (and continues to integrate) its surveillance systems and activities to achieve greater efficiency and deliver more integrated and timely information to its stakeholders and end-users for the benefit of public health.

The following simplified diagram in Figure 1 provides a summary of the current and proposed role of ESR as a central repository/router for notification data.

Figure 1:   Proposed electronic notifications repository
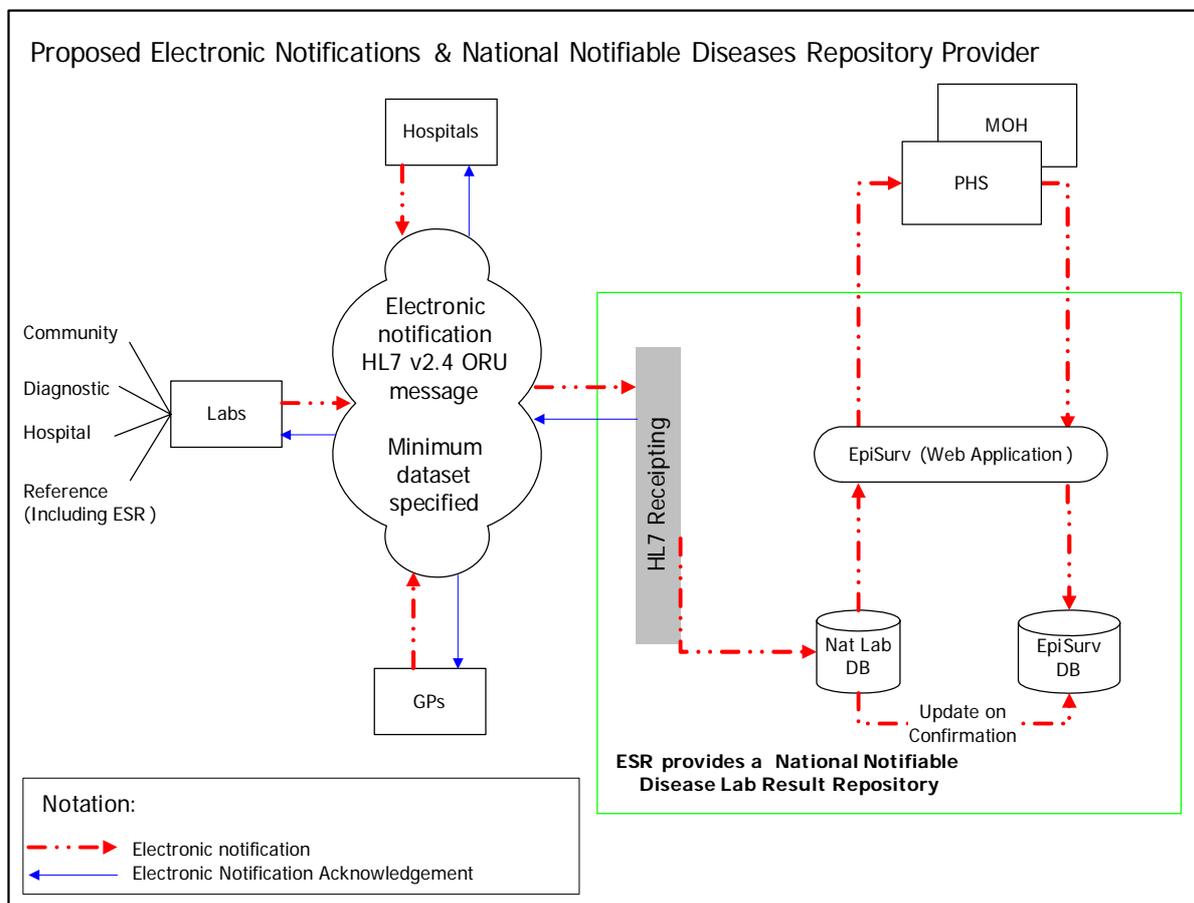
2.3   Business processes

2.3.1   Pre-December 2007 notification processes

Before December 2007 the source, method and form of transfer for notification information varied between public health units. Most notifications were received by telephone or fax ('manually'). Notification information could be recorded on a locally designed notification form by staff at the medical practice, or by public health unit staff as it was received.

At the public health unit, information was either written on a paper form and then entered into EpiSurv via a web-based form, or entered directly into EpiSurv and the case report form printed from there, thus creating an electronic copy and a hard copy record. Most public health units used some form of cover sheet to record information for the case. The case report form and cover sheet were then forwarded to other public health units or territorial authority staff for review and investigation of the case.

The initial details recorded in EpiSurv were updated and added to as more information became available (investigation and outcome). Once all investigations had been completed, the case was closed. Cases could be reopened if further information became available. A schematic overview of the old system is shown in Figure 2.

Figure 2:   Pre-December 2007 processes and procedures for notification of diseases and conditions
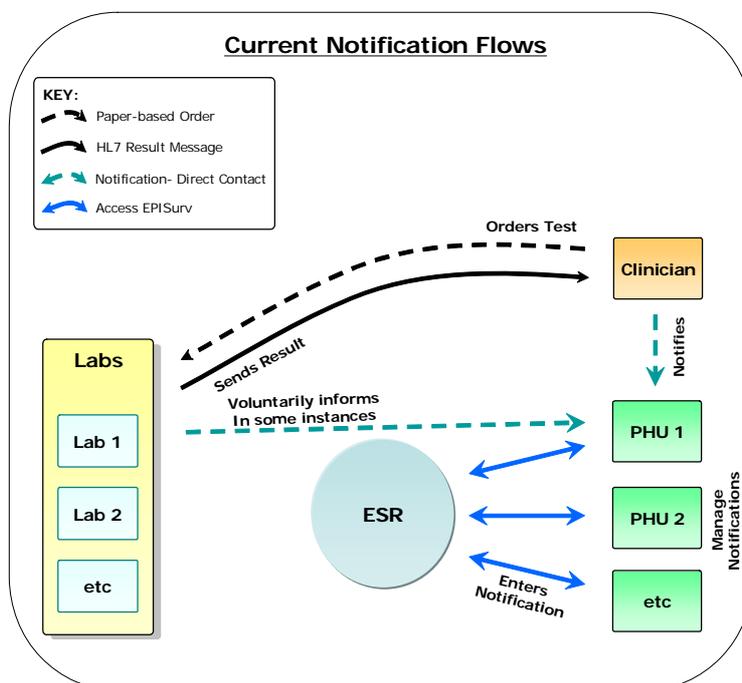
Clinicians were required to report notifiable diseases and conditions to the Medical Officer of Health listed under Schedule 1 of the Health Act 1956. This included notification on suspicion.

2.3.2   Post-December 2007 notification processes

To meet the new legal requirements, the person in charge of a medical laboratory will have several options to report, depending on their laboratory's capacity. The following methods may be used to notify medical officers of health:

- manual notification, including phone or fax

- electronic copying of test results from a DHB laboratory to a DHB public health unit (for DHB patients only)[1]

- sending a modified[2] HL7 message electronically to the Medical Officer of Health

- electronic notification via the national EpiSurv system.

Laboratories may decide to continue to use a manual system, and in some smaller districts this will not cause any problems due to their small volumes of notifiable disease results. Those public health units that receive an HL7 message directly from laboratories may wish to consider using an HL7 viewer (a basic software package) to enable the receipt and dislay of electronic information from laboratories. The public health units will need to work closely with their local laboratories to ensure the information received using an HL7 viewer remains compliant with the Privacy Act.

DHB hospital laboratories will need to approach their corporate services to determine what information can be transferred from the hospital laboratories to the local public health unit. Organisation structures, governance and contractual arrangements will differ from DHB to DHB. It may be permissible to send test results unconnected to the notification to another medical practitioner (eg, a medical officer of health within the same DHB). Because the restrictions will differ for each DHB, the Ministry advises DHBs to seek their own legal advice on this issue.

For private laboratories, all patient-identifiable information not required by a medical officer of health for public health action must be removed from the test result before it can be transferred to the medical officer of health.

Laboratories and public health units are encouraged to continue working together to develop solutions/processes appropriate to local circumstances, bearing in mind that a national electronic system with a central repository is the desired outcome of the laboratory notification project. Whatever interim solution has been adopted post-18 December 2007, public health units and their local laboratories should plan for a transition to the national electronic system over time.

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[1]   This option may not be available to all DHB laboratories due to organisation structures and contractual arrangements.

[2]   A copy of the test results modified to exclude all patient identifiable information not required by the medical Officer of health

2.3.3 Interim notification data flow

Figure 3 provides a simplified view of the interim flow of information for direct notification of notifiable diseases.

Figure 3: Interim flow for direct notification
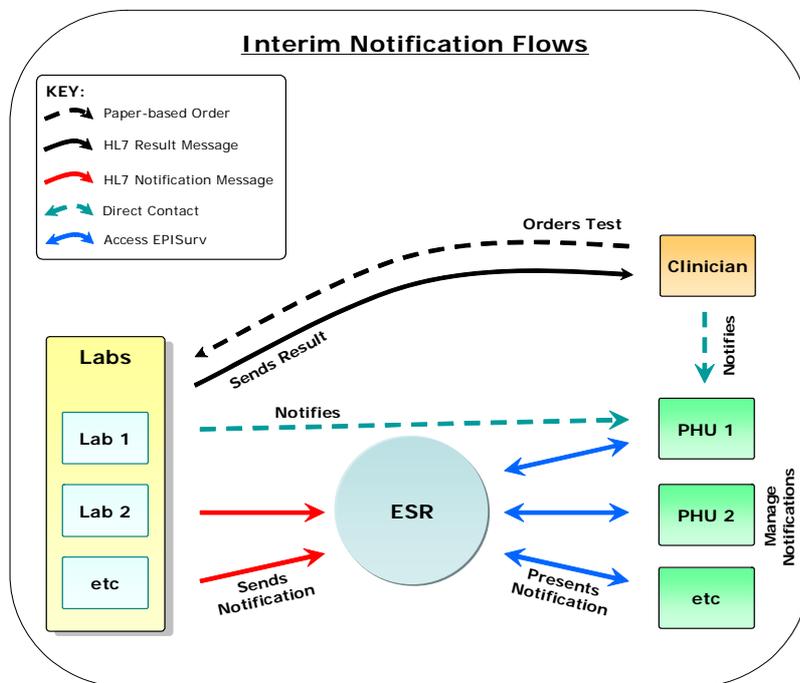
The notification messages can comply with the current HISO HL7 standard (as at February 2008 this is version 2.4) and HealthLink's HL7 version 2.1 message format (as an interim solution only).

Direct contact between a laboratory and a public health unit may be via phone, fax or email, or possibly an electronic message. Typically this would be because a laboratory is unable to send a notification message that meets the required specification. Where an electronic message is sent directly to a medical officer of health, the public health unit will require the capability to receive such information and will need to manually create a case in EpiSurv.

The participants are described in Table 1.

Table 1: The participants in the notification processes

Participant	Role
Clinician	Requests laboratory tests and sends a notification message to a public health unit (via EpiSurv) on suspicion of a notifiable disease.
Laboratory	Undertakes the tests requested, sends the results to the requesting clinician and sends a notification message (via EpiSurv) to a public health unit on confirmation of a notifiable disease.
ESR (Environmental Science & Research)	Receives a notification message from a labboratory and a health care practitioner, stores the notification information in EpiSurv, and alerts the appropriate public health unit.
	ESR operates EpiSurv, a national notifiable diseases reporting and basic case management system.
Medical Officer of Health	Accesses a 'notifications module' on EpiSurv via a web-browser on a computer at the PHU. Case report forms are created where necessary (an automated process). The medical officer of health may contact the attending clinician, testing laboratory and/or patient for information, follow-up or public health action purposes.
Message broker	While not shown in the diagram, the broker's role is to manage laboratory order and results messages and notification messages to ensure they are securely passed between the appropriate parties: in this case, a clinician and a laboratory, a laboratory and ESR, and a clinician and ESR.
Communication network	While not shown in the diagram, this is the underlying telecommunications-related infrastructure over which messages are securely passed between the parties; in this case, the Health Network.

Laboratory test orders, results and notification messages ensure information is provided in a structured and consistent way and can be easily stored and processed by ESR's EpiSurv system. A public health unit does not need to manually create a case in EpiSurv. These messages comply with the current HISO HL7 standard (as at February 2008 this is version 2.4).

Direct contact between a clinician and a public health unit may be via phone, fax or email. Typically this would be because a clinician wants to provide early warning to a public health unit regarding a suspected patient with a notifiable disease. In the future, it is likely that clinicians will also be able to send electronic notifications to a public health unit via EpiSurv using, for example, their practice management system.

2.3.4 Target notification data flow

Figure 4 provides a simplified view of the targeted future flow of information for direct notification of notifiable diseases.

Figure 4: Target flow of information for direct notification

The participants are the same as in the interim diagram (Figure 3).

2.3.5 End-to-end laboratory notification process map

The map below (Table 2) sets out the main notification routes required for different circumstances, depending on whether a manual or an electronic notification system is used and whether more than one laboratory is involved in testing the sample. Simplified diagrams showing only the electronic messaging are provided in section 0.

Table 2:   Main notification routes

Clinician	Laboratory 1	Laboratory 2	Overseas laboratory	ESR	Medical officer of health receives notification
Sends notification to relevant MO of H on suspicion of communicable disease (phone, fax, email, HL7)					→
	Scenario 1				
Requests laboratory test →	Performs test. Uses laboratory notification flowcharts to assess if and when to send a notification to MO of H.				
	If notifiable, the laboratory must immediately send notification to MO of H.				
	If using a manual system of notification, Laboratory 1 faxes, phones or emails relevant MO of H.				→
	If using the national electronic system, Laboratory 1 sends an HL7 version 2.1 or version 2.4 message to relevant MO of H via EpiSurv.			ESR processes the message in real time and sends to the relevant MO of H.	→
Receives test results ←	Sends test results back to the clinician.				
	Scenario 2				
	If Laboratory 1 generates either a partial or first result and then sends a sample to another laboratory for testing, then it sends notifiable cases to MO of H (manual or electronic).				→
	Sends sample to second laboratory →	Tests sample. If notifiable result, notifies MO of H			→
←		Sends test results to clinician and/or Laboratory 1			
	←	Where possible lets Laboratory 1 know Laboratory 2 has notified when sending back the test results.			

Clinician	Laboratory 1	Laboratory 2	Overseas laboratory	ESR	Medical officer of health receives notification
	Scenario 3 Laboratory 1 receives a sample that it cannot test and must forward to another laboratory	Tests sample. ————————————————————————————————————→ If results are notifiable, sends notification to MO of H Sends test results back to practitioner and/or Laboratory 1			
	Scenario 4 Laboratory receives sample that requires testing overseas. Any notifiable results from initial testing must be notified to MO of H. Sends test to overseas laboratory. All notifiable test results received from overseas laboratory must be notified to MO of H.	————————————————————————————————————→	Laboratory performs tests and sends results back to original New Zealand laboratory.		

3   Information Requirements

Currently, laboratories receive, but do not enter, some patient-specific information into their information systems (eg, the patient's address). Because the test results are sent back to the requesting clinician, who already has the patient's details, there is no requirement for such information.

From 18 December 2007 laboratories have been required by law to provide the Medical Officer of Health with a subset of the ideal data set. The absolute minimum information required by the Medical Officer of Health to ensure public health action can be initiated following notification (by contacting the clinician) is given in the following list:

- patient name
- date of birth[3]
- name of referring practitioner
- disease (code)
- laboratory name
- public health unit (code)[4]
- sample reference number (filler order number).

Based on existing processes and technology, laboratories should be able to provide the mandatory six items of above information. It is important that the appropriate PHU code be assigned to each notification to ensure necessary action can be taken.

Due to privacy requirements, laboratories must send only the test results relating to the notifiable disease in question. Public health units will require only some negative results to enable de-notification of a previous clinician notification (e.g. invasive meningococcal disease).

Ideally, additional information will be available to a public health unit upon notification (see the list below). Initially, if not provided by a laboratory, this information will need to be collected from secondary sources (the clinician, or from other hospital or other systems):

- NHI (National Health Index) number
- gender
- ethnicity
- occupation
- address details (house number, street name, suburb, town/city, postcode)
- patient's and clinician's contact details
- phone numbers (home, business, mobile)
- diagnosis/clinical information
- unique reference number

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[3]   If not available use the date: 1/1/1900 .

[4]   Public health unit in the health district where the case was staying at the time of illness; if this is not known, refer the notification to your local public health unit.

- symptoms
- date of onset.

It is envisaged that a rich data set sent directly from laboratories to public health units, including all or most of the information outlined above, will become a reality in the near future following developments such as electronic ordering of laboratory investigations.

4 Communicating with ENDMS using HL7

4.1 Flat file not supported

It is important to note that current laboratory messages are usually converted to a flat file format from the HL7 message before being sent to a GP system. This process places a number of restrictions on the generated message, which are documented in the HealthLink implementation guidelines. As the messages to ESR will not be converted to the flat file format, some of these restrictions will not apply. Any restriction that is in the HealthLink document which is not repeated in this document will not apply to this implementation. Conversely, any message constructed using this guide may not be able to be sent to any recipient using a flat file format.

4.2 These guidelines

This document presents guidelines for sending HL7 messages to the ENDMS. It must be read in conjunction with the documents listed below. The New Zealand Health Information Standards Organisation (HISO) standards and implementation guides are available at www.hiso.govt.nz.

Note that this document relates to the initial or 'phase 1' roll out of the national system. It is expected that some of the requirements will be changed as progress is made.

Table 3: Related documents

Document number	Document title	Purpose
10008.1	Pathology and Radiology Messaging Standard	Describes the structure and content of the result message exchanges between sender and receiver
10008.2	Pathology and Radiology Implementation Guide Health Level Seven (HL7) Standard for Electronic Data Exchange in Healthcare Environments, Version 2.1 (HL7 2.1) Health Level Seven Inc, Ann Arbor, 1990 Health Level Seven Inc., HL7 Standard Version 2.4: An application protocol for electronic data exchange in healthcare environments	Provides assistance when implementing systems that utilise the standards in this suite
LABRES/HLK/100	*Laboratory Results in The HealthLink Service*, Version 1.0 (Lab Spec), Orion Systems (NZ) Limited, 1996	

The first two standards in the above suite of standards are based on Health Level Seven (HL7) version 2.4.

The messages covered are test results provided by laboratories and the response from ESR. Notifications from other practitioners are not covered here, but over time it is envisaged that additional information will be managed by providing a copy of an electronic laboratory order to ESR, or sending additional information using a referral message (REF) using current RSD version 2.4 HL7 standard.

This guide covers the following topics.

- Specific use of message segments where there are alternative uses, and the enforcement of optional fields that are required for the ENDMS

- Provision of all the technical information required for a health provider (or their system vendor) to make all the necessary system changes to support the ENDMS.

4.3   Exchanging Information with the ENDMS

The ENDMS will be adopting the new HL7 Pathology messaging standard (version 2.4). The system will also accept messages in the interim based on the existing HL7 version 2.1 commonly in use. Message specifications have been developed based on information requirements for disease notification. This information includes:

- demographic information
- relevant clinical information
- test results.

This document provides a guide to adopting the required messaging standards for the ENDMS.

Phase 1, which covers the transmission of messages from laboratories, should use HealthLink's store and forward messaging service to transport messages to the ENDMS using HL7 version 2.4, or version 2.1 as an interim measure. Alternative mechanisms for message transportation will be developed in the future.

The following diagrams show the electronic messages involved in each scenario, followed by a description of the steps involved. Each message has a corresponding acknowledgement message, but these have been omitted from the diagrams in the interests of simplicity.

4.3.1   Transaction 1 – standard notification

Figure 5:   Flow for standard notification
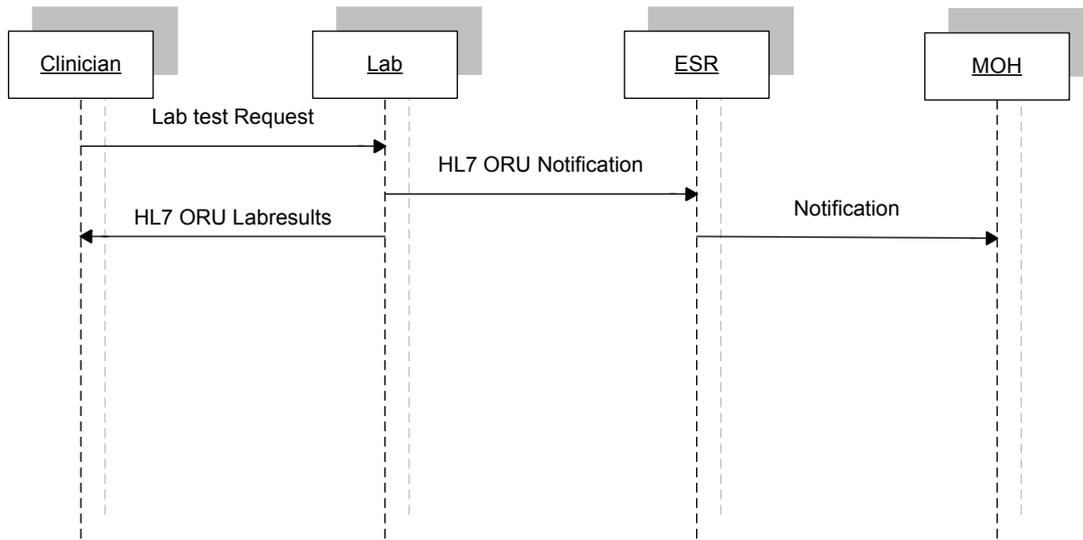
Step 1. The clinician examines the patient, obtains a sample and requests a laboratory test.

Step 2. The laboratory performs tests, and uses laboratory notification flowcharts to assess if and when to send a notification to the Medical Officer of Health. If notifiable, the laboratory must immediately send an HL7 version 2.1 or version 2.4 message to the relevant Medical Officer of Health, via EpiSurv.

Step 3. ESR processes the message in real time. Notifications become available, on EpiSurv, to the relevant Medical Officer of Health.

Step 4. The laboratory sends the test results back to the clinician.

4.3.2　Transaction 2 – Partial send-away testing and notification

Figure 6:　Flow for partial send-away testing and notification

Step 1. The clinician examines the patient, obtains a sample and requests a laboratory test.

Step 2. The laboratory performs the tests, generates either a partial or first result, and then sends a sample to another laboratory for testing.

Step 3. The first laboratory uses laboratory notification flowcharts to assess if and when to send a notification to the medical officer of health. If notifiable, the laboratory must immediately send an HL7 version 2.1 or version 2.4 message to the relevant Medical Officer of Health via EpiSurv.

Step 4. The second laboratory performs tests. If a notifiable result is found, it notifies the Medical Officer of Health.

Step 5. ESR processes the messages in real time. Notifications become available, on EpiSurv, to the relevant Medical Officer of Health.

Step 6. Where possible, the second laboratory advises the original laboratory that it has notified the Medical Officer of Health when sending back the test results.

Step 7. Both laboratories send their test results back to the clinician.

4.3.3 Transaction 3 – Full send-away testing and notification

Figure 7: Flow for full send-away testing and notification

Step 1. The clinician examines the patient, obtains a sample and requests a laboratory test.

Step 2. The laboratory cannot perform the requested tests and sends a sample to another laboratory for testing.

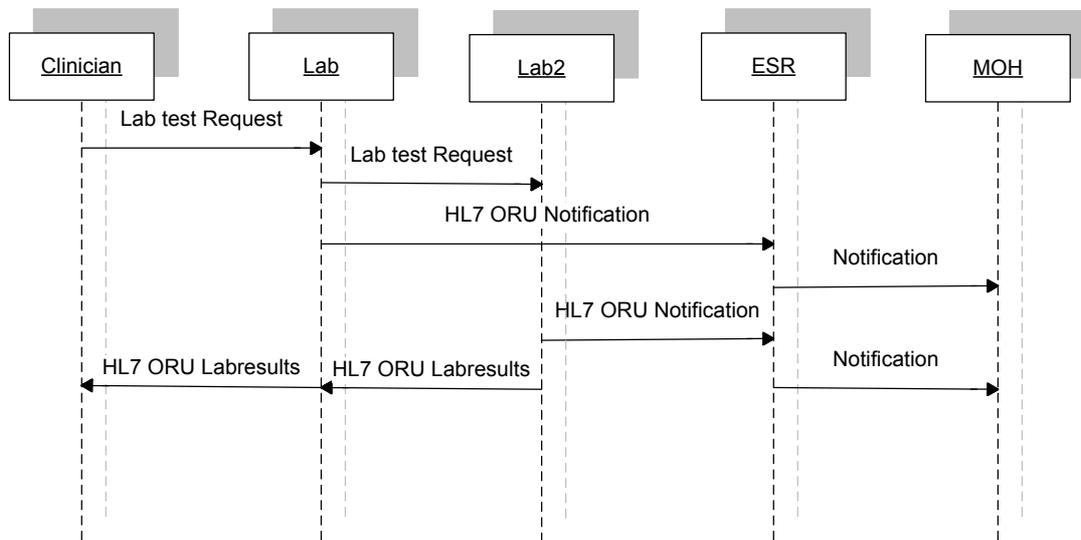Step 3. The second laboratory performs the tests. The laboratory uses laboratory notification flowcharts to assess if and when to send a notification to the Medical Officer of Health . If notifiable, the laboratory must immediately send an HL7 version 2.1 or version 2.4 message to the relevant medical officer of health via EpiSurv.

Step 4. ESR processes the message in real time. Notifications become available, on EpiSurv, to the relevant Medical Officer of Health.

Step 5. Where possible, the second laboratory advises the original laboratory that it has notified the Medical Officer of Health when sending back the test results.

Step 6. The second laboratory sends the test results back to the clinician.

4.3.4 Transaction 4 – Overseas send-away testing and notification

Figure 8: Flow for overseas send-away testing and notification
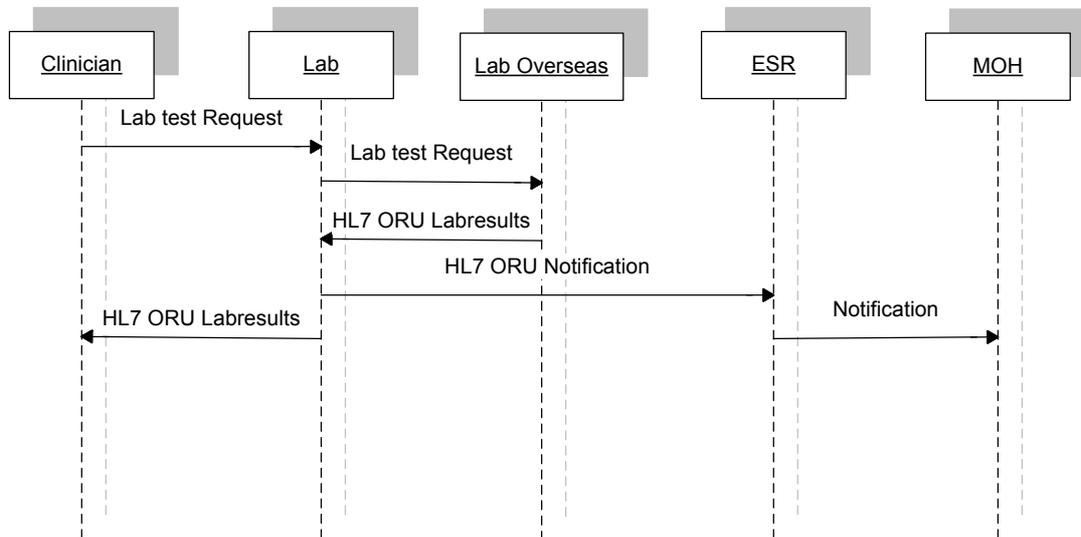
Step 1. The clinician examines the patient, obtains a sample and requests a laboratory test.

Step 2. The laboratory cannot perform the tests and sends a sample to an overseas laboratory for testing.

Step 3. The overseas laboratory performs tests and sends the test results back to the original laboratory.

Step 4. The original laboratory uses laboratory notification flowcharts to assess if and when to send a notification to the medical officer of health. If notifiable, the laboratory must immediately send an HL7 version 2.1 or version 2.4 message to the relevant medical officer of health via EpiSurv.
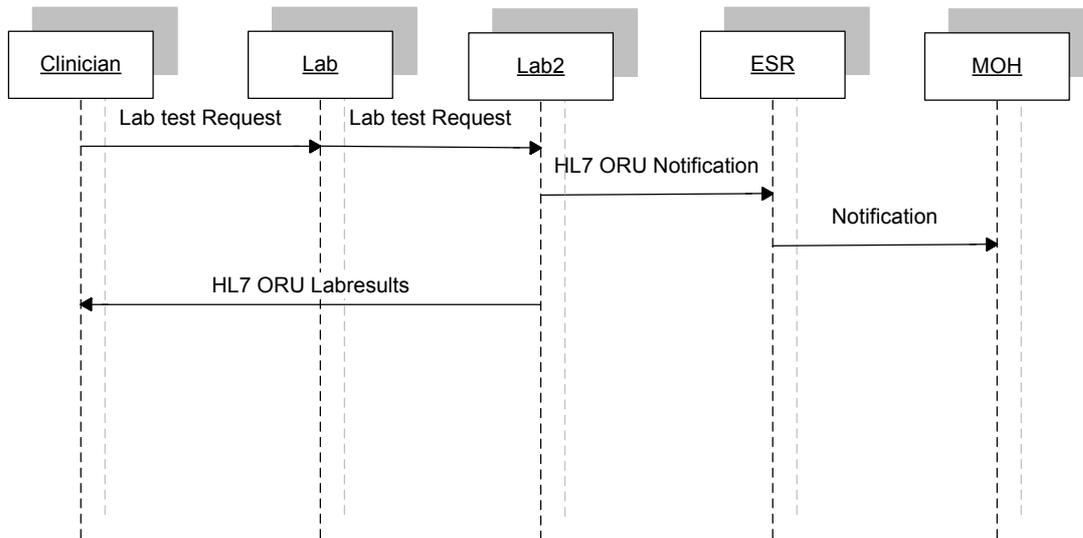
Step 5. ESR processes the messages in real time. Notifications become available, on EpiSurv, to the relevant Medical Officer of Health.

Step 6. The laboratory sends the test results back to the clinician.

4.4 ORU laboratory results message

The tables below show the segments that are used, and the responses. Items enclosed within square brackets ([ ]) are optional, and those within braces ({ }) may be repeated multiple times. The tables are followed by some general considerations and a detailed description of the segments.

It must be stressed that these should be read in conjunction with the appropriate standard. While some items may be optional in HL7, they may be mandatory in this implementation and further restrictions may be applied that are not in the reference standard.

Table 4: ORU laboratory results segment

Segment name	Description
MSH	Message header
MSA	Message acknowledgement segment (version 2.1 only)
{	
PID	Patient identification
[PV1]	Patient visit (used to convey notification number)
{	
OBR	Order detail – observation request
{	
OBX	Observation/result (optional in HL7 version 2.4 but required for this implementation)
[{NTE}]	Notes and comments on result information
}	
}	
}	

Notes:

The MSA segment was originally included in HL7 version 2.1 to allow for solicited laboratory result messages. Even though the ORU message is unsolicited, this segment is included for backwards compatibility reasons.

Although the PV1 segment is officially optional, in practice it is almost always sent because many practice management systems require this message to be sent. Please see the specific notes on PV1 for more information on the usage of this segment.

The OBX segment is mandatory.

4.5 ACK– response message

Table 5: ACK response message

Segment name	Description
MSH	Message header
MSA	Message acknowledgement
[ERR]	Error

4.6 General considerations

This section must be read in conjunction with the following documents published by HISO:

- 10008 *Pathology and Radiology Messaging Standard*
- 10008 *Pathology and Radiology Implementation Guide*.

It is assumed that the reader of this document has a good understanding of HL7 messaging.

The MSA segment was originally included in HL7 version 2.1 to allow for solicited laboratory result messages. Even though the ORU message is unsolicited, this segment is included for backwards compatibility reasons. It is a mandatory requirement to send the MSA segment in a version 2.1 ORU message.

The HealthLink network has a maximum file size for any single message file of 2 MB.

Only segments and fields that are used in the ENDMS message have been documented here. Refer to 1008 and HealthLink's *Laboratory Results in the HealthLink Service Specification* for a full list of segments and field properties.

The sending and receiving facility codes or 'EDI' addresses are used by the HealthLink network to direct the message to the correct destination, and the destination swaps the sender and receiver facility codes so the HealthLink network can return the ACK messages to the originator of the results. These fields must contain the correct EDI values.

The ENDMS accepts data as standard unsolicited results (ORU) but restricts some fields to specific ranges of values. Some optional fields are mandatory when sending data to the ENDMS.

The ENDMS does not support delimiters other than the default ones specified in the standard. It is essential that messages be constructed in segmented form, where possible, rather than using large blocks of formatted text.

Only segments MSH, PID, PV1, OBR, OBX and NTE will be processed; any others will be discarded.

It is implied in general by the HL7 standards that non-repeating fields can be repeated by local agreement. The ENDMS will ignore additional repeats.

Where multiple OBX occur with the same code in OBX-3, then sub-IDs will need to be used in OBX-4, starting at 1 and incrementing by 1 for each subsequent OBX in a set.

As most messages to the ESR are copies of messages, the original recipient is lost from the message header. Furthermore, the message header does not use HPI codes. For this reason, all version 2.4 messages must have values for the facility codes in OBR-46 (placer facility code) and OBR-47 (filler facility code) where the name of the coding system is HF for HPI identifiers. As these fields are not available in version 2.1 an interim OBR-18 is to be used for the place facility code (GP) and OBR-21 for the filler (laboratory).

The ENDMS supports ASCII and UNICODE, and any value in MSH-18 will be ignored.

4.7   Diagnosis

When reporting the results, a diagnosis is required as well. There is no provision for a DG1 segment in an ORU message, so the diagnosis will be reported in an OBX segment associated with the requested test. If there are two diagnoses, then two OBX will be supplied and distinguished using sub-IDs in OBX-4. These OBX will be before any result containing OBX.

OBX-3 will contain the LOINC code 29308-4. OBX-5 must contain a value from the following table.

Table 6:   99NZESRDC disease codes

Disease	Code
Acute gastroenteritis	
Adenovirus	ADEN
Astrovirus	ASTR
Bacterial – Other	BOTH
Escherichia coli (excludes VTEC/STEC)	ECOL
Parasite – Other	POTH
Rotavirus	ROTA
Staphylococcus aureus	STAP
Viral – Other	VOTH
Anthrax	ANTH
Arboviral infection	
Barmah Forest virus infection	BARM
Chikungunya fever	CHIK
Dengue fever	DENG
Eastern and Western Equine encephalitis	EWEQ
Japanese encephalitis	JAPA
La Crosse encephalitis	LACR
Murray Valley encephalitis	MURR
Powassan Viral encephalitis	POWA
Reticuloendotheliosis virus	RETI
Rift Valley fever	RIFT
Ross river virus infection	ROSS
Sindbis virus	SIND
St. Louis encephalitis	STLO
Venezuelan equine encephalitis	VENE
West Nile virus	WEST
Arborviral – not elsewhere specified	AOTH
Botulism	BOTU
Brucellosis	BRUC
Campylobacteriosis	CAMP

Disease	Code
Chlamydia	CHLA
Cholera	CHOL
Creutzfeldt-Jakob Disease and other spongiform encephalopathies	CREU[5]
Cryptosporidiosis	CRYP
Cysticercosis	CYST
Diphtheria	DIPH
Enterobacter sakazakii invasive disease	ESAK
Giardiasis	GIAR
Gonorrhoea	GONO
Haemophilus influenzae type b invasive disease	HIBD
Hepatitis A	HEPA
Hepatitis B	
Acute Hepatitis B	HPBA
Chronic Hepatitis B	HPBC
Unspecified Hepatitis B	HPBU
Hepatitis C	HEPC
Hepatitis D	HEPD
Hepatitis E	HEPE
Highly pathogenic avian influenza	HPAI
Hydatid disease	HYDD
Invasive pneumococcal disease	IPND
Blood lead level ≥ 0.48 μmol/L (10 μg/dl)	LEAD
Legionellosis	LEGI
Leprosy	LEPR
Leptospirosis	LEPT
Listeriosis	LIST
Malaria	MALA
Measles	MEAS
Mumps	MUMP
Neisseria meningitidis invasive disease	MEND
Norovirus	NORO
Paratyphoid fever	PARA
Pertussis	PERT
Plague	PLAG
Poliomyelitis	POLI
Primary amoebic meningoencephalitis	PAME
Rabies or other lyssavirus	RABI
Rheumatic fever	RHEU
Q fever	QFVR

[5] CJD notifications should not be entered into or sent to EpiSurv. CJD notifications are to be send to the CJD register at the University of Otago by the responsible public health unit.

Disease	Code
Rickettsial disease	RICK
Rubella	RUBE
Salmonella	SALM
SARS	SARS
Shigellosis	SHIG
Smallpox	SPOX
Syphillis	SYPH
Taeniasis	TAEN
Tetanus	TETA
Toxic shellfish poisoning	TXSP
Trichinosis = trichiniasis = trichinellosis	TRIC
Tuberculosis (new case, reactivation)	TUBD
Tuberculosis, latent (LTBI)	LBTI
Tularemia	TULA
Typhoid	TYPH
Verotoxin-producing *E. coli* (VTEC), also known as Shiga toxin-producing *E. coli* (STEC)	VTEC
Viral haemorrhagic fevers	
Crimean-Congo haemorrhagic fever	CRIM
Ebola haemorrhagic fever	EBOL
Hanta virus	HANT
Kyasanur forest disease	KYAS
Lassa fever	LASS
Marburg haemorrhagic fever	MARB
Omsk Hemorrhagic Fever	OMSK
Viral hemorrhagic fevers – not elsewhere specified	VHFO
Yellow fever	YELF
Yersiniosis	YERS

Note: Items in italics are not currently required to be reported but it is anticipated that they will be added to the reporting requirements shortly.

4.8   Traceability

There will soon be a requirement to link all the processes together. Laboratories may issue a new placer order number when they send a specimen to another laboratory rather than using their original filler order number. If this occurs the link is potentially lost. To address this, a number will be generated as early in the process as possible and maintained within all message transactions. The patient visit segment (PV1-5) will be used to convey this number. This number could be the case number issued by the ESR on initial notification, a concatenation of the GP facility code and the GP order number or the GP order number itself.

The proposed interim procedure is to Leave the field blank until laboratory information systems can be adapted to cater for this requirement.

4.9   Data types

The following data types are used in the definition of segments. All of these are standard HL7 types. Consult HL7 Chapter two for further information.

Table 7:   HL7 data types

Data type	Meaning	Comment
CM	Composite data type	This field is a combination of other data items. Where it occurs, the structure of the composite will be defined in field notes.
DT	Date	Always formatted as YYYYMMDD.
FT	Formatted text	Same as ST but allows embedded HL7 formatting characters.
HD	Hierarchic identifier	Treated the same as ST in this implementation as there is no name space specified.
ID	Coded value	The value in this field must be drawn from a table of HL7 defined values. The table of acceptable values will be found in the field notes.
IS	Coded value	The value in this field must be drawn from a table of user-defined values. The table of acceptable values will be found in the field notes. If the table occurs more than once it will be repeated in an appendix.
NM	Numeric data	A number value.
ST	String data	A string of alphanumeric characters.
SI	Sequence ID	A non-negative integer.
TS	Time stamp	Always formatted as YYYYMMDD[HHMM[SS]]. HL7 allows 4 additional fields of milliseconds. These are not used in this implementation.
TX	Text data	ST that allows some additional special characters.

4.10   HL7 composite data types

These composites are used in the definitions of the segments. Where additional clarification is required, these tables may be repeated in the segment notes. The composites are only those that are used in this document. For composites in fields that are not used, please consult HL7 version 2.1.

4.10.1   AD – address

This composite differs from the standard HL7 version 2.1 composite in a number of ways. Other designation (sub-component 2) is used exclusively as suburb. The country code is entered into the state and province code and not in HL7 defined country code field.

Table 8: AD address composite

Sub-component	Type	Notes
<Street address>^	ST	Limited to 35 characters
<Suburb>^	ST	Limited to 30 characters
<City>^	ST	Limited to 30 characters
<Country code>^	ST	Limited to 7 characters
<Zip or postal code>^	ST	Not used
<Country>	ST	Not used

The sub-component field length limits are to comply with the New Zealand Health Information Service (NZHIS) specification.

4.10.2   CE – coded element

This allows transmission of codes and the associated text.

Table 9: CE coded element composite

Sub-component	Type	Notes
<Identifier>^	ST	
<Text>^	ST	
<Name of coding system>^	ST	
<alternate identifier>^		Not used
<alternate text>^		Not used
<name of alternate coding system>		Not used

4.10.3   CK – composite ID with check digit

This specifies an ID value and associated check digit. For the purposes of this implementation the check digit components will not be used.

Table 10: CK check digit composite

Sub-component	Type	Notes
<ID Number>^	NM	
<Check Digit>^		Not used
<check digit scheme>^		Not used
<assigning authority>		Not used

4.10.4   CN – composite ID number and name

This composite is usually used for identifying medical practitioners throughout the message, be they laboratory or other medical personnel.

Table 11: CN number and name composite

Sub-component	Type	Notes
<ID number>^	ST	Wherever possible this field will contain the HPI number (or NZMC number in the interim) of the provider. Limited to eight characters.
<Family name>^	ST	Limited to 25 characters.
<Given name>^	ST	Limited to 20 characters.
<Middle initial or name>^	ST	Always the middle initial. If the person's name has two middle names then the first middle initial should be used.
<Suffix>^	ST	Not used
<Prefix>^	ST	Not used
<Degree>	ST	Not used

Note: The field length limits are to comply with the NZHIS specification.

4.10.4   CQ − composite quantity

Table 12: CQ quantity composite

Sub-component	Type	Notes
<Quantity>^	NM	
<Units>	CE	

4.10.5   CX – composite ID with check digit

This specifies an ID value and associated check digit. For the purposes of this implementation the check digit components will not be used.

The CX data type is used for specifying an identifier with its associated administrative detail. The maximum length of this field is 250. The table below shows the CX data type components.

Table 13: CX composite ID with check digit

Sub-component	Type	Notes
<ID>	ST	The value of the identifier itself.
<Check digit>	ST	Not used in this implementation.
<Code identifying the check digit scheme employed>	ID	Not used in this implementation.
<Assigning authority>	HD	Refer to pathology standard for values. The assigning authority is the system, application or body that actually generates the ID number. This would normally be NZLMOH. If this field is blank, then the value in the first component is assumed to be the National Health Index (NHI) number assigned by the NZ Ministry of Health (NZLMOH). If another identifier is being messaged, then this field must be filled in.
<Identifier type code>	ID	A code corresponding to the type of identifier. In some cases this code may be used as a qualifier to the <assigning authority> component. Not likely to be used.
<Assigning facility>	HD	The place or location identifier where the identifier was first assigned to the patient.
<Effective date>	DT	The first date, if known, on which the identifier is valid and active.
<Expiration date>	DT	The last date, if known, on which the identifier is valid and active.

EI – entity identifier

The entity identifier defines a given entity within a specified series of identifiers. Typical use is for placer and filler order numbers. The table below shows the EI components.

Table 14: EI entity identifier composite

Sub-component	Type	Notes
<Entity identifier>^	ST	This is usually defined to be unique within the series of identifiers created by the <assigning authority>, defined by a hierarchic designator.
<Namespace ID>^	IS	Used as the HL7 identifier for the user-defined table of values for this component.
<Universal ID>^	ST	A string formatted according to the scheme defined by the <universal ID type>.
<Universal ID type>	ID	Refer to the standard for valid values.

In the case of order numbers, the following usage is recommended.

Table 15: Order number identifier

Sub-component	Type	Notes
<Entity identifier>^	ST	Actual order number (mandatory).
<Namespace ID>^	IS	Name of the organisation issuing the number (optional).
<Universal ID>^	ST	Code of the organisation issuing the number. This should be the HPI facility code where possible (mandatory if not the normal issuer; eg, if placer order number is generated by the laboratory).
<Universal ID type>	ID	Issuer of the code in the previous component. This would normally be HF for HPI codes, M for HFC codes used in NIR, or L for local (mandatory if previous component present).

4.10.8 PN – patient name

This composite is used for the name of any patients identified in the message.

Table 16: PN patient name composite

Sub-component	Type	Notes
<Family name>^	ST	Limited to 25 characters.
<Given name>^	ST	Limited to 20 characters.
<Middle initial or name>^	ST	Always the middle initial. If the person's name has two middle names, then the first middle initial should be used.
<Suffix>^	ST	Not used
<Prefix>^	ST	Not used
<Degree>	ST	Not used

Note: The field length limits are to comply with the NZHIS specification.

4.10.9   XAD – extended address

This composite differs from the standard HL7 version 2.4 composite in a number of ways. The other designation (sub-component 2) is used exclusively as suburb.

Table 17:   Extended address composite

Sub-component	Type	Notes
<Street address>^	ST	Limited to 35 characters
<Suburb>^	ST	Limited to 30 characters
<City>^	ST	Limited to 30 characters
<Province>^	ST	Limited to 7 characters
<Zip or postal code>^	ST	
<Country>	ST	Limited to 7 characters ISO3166 codes
<Type>^	ID	C, P, M, B
<GeoCode>^	ST	Both separated by colon
<County code>^	IS	Not used
<Domicile code>^	IS	
<Address code>^	ID	Not used
<Address validity range>	DR	

Note: The field length limits are to comply with the NZHIS specification.

4.10.10   XCN extended composite ID number and name for persons

This field is usually reserved for the identification of health care providers. The maximum length of this field is 250. The table below shows the XCN components.

Table 18:   Extended number and name for persons

Sub-component	Type	Notes
<ID number>^	ST	CPN, NZMC, NZNC or APC number
<Family name>^	FN	See note below
<Given name>^	ST	
<Middle initial or name>^	ST	
<Suffix>^	ST	
<Prefix>^	ST	
<Degree>^	IS	
<Source table>^		Not used
<Assigning authority>^	HD	A code corresponding to the type of identifier (eg, HI for HPI code)

Sub-components of family name are given in Table 19.

Table 19: Sub-components of family name

Sub-component of family name	Type	Notes
<Surname>	ST	
<Own surname prefix>	ST	
<Own surname>	ST	
<Surname prefix from partner/spouse>	ST	
<Surname from partner/spouse>	ST	

4.10.11 XPN – extended person name

This composite is used for the name of any patients identified in the message.

Table 20: Extended person name

Sub-component	Type	Notes
<Family name>^	ST	Limited to 25 characters.
<Given name>^	ST	Limited to 20 characters.
<Middle initial or name>^	ST	Always the middle initial. If the person's name has two middle names then the first middle initial should be used.
<Suffix>^	ST	Not used
<Prefix>^	ST	Not used
<Degree>^	ST	Not used
<Name type code>	ST	A, B, C, D, I, L, M, N, P, R, S, T, U

Note: The field length limits are to comply with the NZHIS specification.

4.10.12 XTN – extended telecommunications number

Table 21: Extended telecommunications number

Sub-component	Type	Notes
<Phone number string>^		Not used
<Telecommunication use code>^	ID	Indicates if it is home, work, etc
<Telecommunication equipment type>^	ID	Indicates if it is a phone or fax etc
<Email address>^	ST	
<Country code>^	NM	
<Area code>^	NM	
<Number>^	NM	
<Extension>^	NM	
<Any text>	ST	

4.11   MSH − message header segment

Note: In the following tables, the 'Required for' field is to be interpreted as follows: BusProc (Business Process) − necessary to ensure an essential business process is able to be fulfilled; PHAction (Public Health Action) − to enable public health unit staff to assess the need for, and perform the appropriate, public health action(s); Legislation – required under legislation.

Table 22:   MSH message header segment

Data element	Field	Cardinality /optionality (length) Version 2.4	Cardinality / optionality (length) Version 2.1	Required for:	Comments	Future requirements
Field separator	MSH-1	Required (1)	Required (1)	BusProc	The field separator character will be '|'	
Encoding characters	MSH-2	Required (4)	Required (4)	BusProc	To ensure messaging consistency, the following encoding characters must be used: ^ − component separator ~ − repetition separator \ − escape character & − sub-component separator	
Sending application	MSH-3	Optional (180)	Required (15)	BusProc	Field is HD data type for version 2.4 but treated the same as ST as used in version 2.1 If the sending application which generated the message is not named, this field should contain the text 'LABRESULT' for version 2.1.	
Sending facility	MSH-4	Required (180)	Required (20)	BusProc and PHAction	The HealthLink EDI account name of the sending facility. This must be filled in correctly so that message acknowledgements can be correctly processed and delivered to the appropriate system. Field is HD data type for version 2.4 but treated the same as ST as used in version 2.1.	
Receiving application	MSH-5	Optional (180)	Required (15)	BusProc	Field is HD data type for version 2.4 but treated the same as ST as used in version 2.1. The default value is LABRESULT	For version 2.4 and where possible in version 2.1 this should contain EpiSurv.
Receiving facility	MSH-6	Required (180)	Required (30)	BusProc	The HealthLink EDI account name of the intended recipient of this message, as nominated by the MO of H. Field is HD data type for version 2.4 but treated the same as ST as used in version 2.1.	

Data element	Field	Cardinality /optionality (length) Version 2.4	Cardinality / optionality (length) Version 2.1	Required for:	Comments	Future requirements
Date/time of message	MSH-7	Required (26)	Required (14)	BusProc	HL7 version 2.4 format: YYYY[MM[DD[HHMM[SS[.S[S[S]]]]]]]][+/-ZZZZ] HL7 version 2.1 format: YYYYMMDD[HHMMSS]	
Message type	MSH-9	Required (13)	Required (7)	BusProc	HL7 version 2.4 format minimum requirement is the text 'ORU' or 'ACK'. The field can optionally extend to the trigger event and message structure components in the following format: ORU^R01^ORU_R01 ACK^R01^ACK_R01 HL7 version 2.1 format is the text 'ORU'; or 'ACK' for acknowledgment messages	
Message control ID	MSH-10	Required (20)	Required (20)	BusProc	Number or other identifier generated by the sending application that uniquely identifies a message.	
Processing ID	MSH-11	Required (3)	Required (1)	BusProc	The following values must be used: P – normal processing D – debugging T – training. P is the default	
Version ID	MSH-12	Required (60)	Required (8)	BusProc	HL7 version 2.4 format: '2.4' HL7 version 2.4 format can optionally extend to the 'Internationalisation Code' and 'International Version ID' components allowed by HL7. HL7 version 2.1 Format: '2.1'	

Notes: Only fields that are processed have been included in the above table. All others in the standards specification are ignored.

In the 'Required for' field: BusProc (Business Process) − necessary to ensure an essential business process is able to be fulfilled; PHAction (Public Health Action) − to enable public health unit staff to assess the need for, and perform the appropriate, public health action(s); Legislation – required under legislation.

4.11.1   MSH-1 – field separator

The field separator character will be '|'.
Example:
MSH|^~\&|DELPHIC...

4.11.2   MSH-2 – encoding characters

This field contains the separator characters for component, repeat and the escape character and sub-components, respectively. We strongly recommend that this field contain '^~\&'. Please see the section above on separators.
Example:
MSH|^~\&|DELPHIC|MEDLAB|LABRESULT|...

4.11.3   MSH-3 – sending application

This field should be filled in with the name of the sending application. Since this message is usually sent from a laboratory, this normally contains the name of the laboratory application. If the laboratory application is not named, this field should contain the text 'LABRESULT'; most messages use this value.
Example: In this case the sending laboratory uses the Delphic Laboratory Results module:
MSH|^~\&|DELPHIC|ediaccnt|LABRESULT|...

4.11.4   MSH-4 – sending facility

This field should be filled in with the HealthLink EDI account name of the sending facility. This must be filled in correctly so that message acknowledgements can be correctly processed. This field should not be more than eight characters in length and should always be in lower case.

Variance to HL7: eight-character limit on the mailbox name. The use of this field could be extended when alternative communication methods are introduced.

Example:
MSH|^~\&|DELPHIC|ediaccnt|EPISURV|...

4.11.5   MSH-5 – receiving application

This field identifies the receiving application. Since the receiving application is presently the HealthLink laboratory result processor, this field should always contain the text 'LABRESULT'. For version 2.4 (and where possible in version 2.1) this should contain EpiSurv.
Example:
...|^~\&|DELPHIC|ediaccnt|EpiSurv|esrendms|...

4.11.6   MSH-6 – receiving facility

This field should be filled in with the HealthLink EDI account name of the intended recipient of this message. This must be filled in correctly so that the message can be delivered to the correct destination. HealthLink EDI accounts are always eight or fewer characters and are always lower case. The use of this field could be extended when alternative communication methods are introduced.
The address for notifications is esrendms.
Example:

...|DELPHIC|ediaccnt|EPISURV|esrendms|20000120092032|...

4.11.7   MSH-7 – date/time of message

This is the date/time that the sending system created the message. HealthLink always expects this information in the following format for version 2.1 (the extended precision offered by version 2.4 is not seen as adding any value):

Format: YYYYMMDD[HHMMSS]

This field is optional for version 2.1, but it is strongly recommended that it be filled at all times to maximum precision.
Example: This message was generated on 20 January 2000 at 9:20:32am:
...| EpiSurv | esrendms |20000120092032|PKI|ORU|...

4.11.8   MSH-8 – security

This field is used to implement security features. HealthLink uses a public key infrastructure, and this field will have its contents replaced by PKI.
Example: A PKI security scheme was employed when sending this message:
...|20000120092032|PKI|ORU|0155002273|P|2.4

4.11.9   MSH-9 – message type

This field identifies the message type. It should always contain 'ORU' for laboratory result messages and 'ACK' for acknowledgement messages.
Variance to HL7: the HL version 2.1 specification does not support trigger events.
Example: This message is an ORU message:
...|20000120092032|PKI|ORU|0155002273|P|2.4

4.11.10   MSH-10 – message control ID

This field is a number or other identifier that uniquely identifies a message from a particular sender. Each sender is responsible for ensuring that the message control IDs from their facility are unique.
Example:
...|20000120092032|PKI|ORU|0155002273|P|2.4

4.11.11   MSH-11 – processing ID

This field tells how a receiving system should process this message.

Table 23:   MSH-11 processing ID

Value	Meaning
P	Process this message as normal.
D	This message is being used for debugging purposes. It should be properly acknowledged, but the data should be ignored.
T	Training.

Example: This message should be processed as normal:
...|20000120092032|SECURITY|ORU|0155002273|P|2.4

4.11.12   MSH-12 – Version ID

This field contains the HL7 version number of this message. This is always 2.1 only, or 2.4 with further optional clarification components.
Example: This message subscribes to HL7 version 2.4.
...|20000120092032|SECURITY|ORU|0155002273|P|2.4

4.11.13   MSA − message acknowledgement segment

The MSA segment contains information to be sent when replying to or acknowledging another message. HL7 version 2.1 allows the ORU message to be used as a response for a request for laboratory results (solicited), as well as being the standard unsolicited observation reporting message. Only the unsolicited mode is used by HealthLink, but this segment is required for version 2.1 ORU messages. The data in this segment can be safely ignored by new implementations, but older systems still require this segment.

Table 24:   MSA message acknowledgement segment

Data element	Field	Cardinality / optionality	Required for:	Comments
Acknowledgement code	MSA-1	Required (2)	BusProc	Values are AA, AE, AR
Message control ID	MSA-2	Required (20)	BusProc	To ensure matching of response to original message.
Text message	MSA-3	Optional (80)	BusProc	Error message text.
Error condition	MSA-6	Optional (250)	BusProc	Occurs only in version 2.4. Information may be in an ERR segment.

Note: only fields that are processed have been included in this table. All others in the standards specification are ignored.

4.12.1   MSA-1 – acknowledgement code

This field provides information about the processing of the message to which this message is a response. This field will always be present, and must contain one of the following values. In an unsolicited ORU message this field should contain 'AA'.

Table 25:   MSA-1 acknowledgement code

Value	Meaning	Comment
AA	Application accept	The message was processed successfully. In an ORU message this field will always have this value.
AE	Application error	The message had semantic difficulties.
AR	Application reject	The message contained errors such as required fields missing or fields too long.
		This may also be generated if a serious error has been caused by processing the original message.

Example: The message that this message is replying to was processed correctly:
MSA|AA|0155002273|This is a text message

4.12.2   MSA-2 – message control ID

This field contains the message control ID of the message sent by the sending system to which this message is a response. Thus the systems can keep a record of those messages that have been responded to and those that have not. In an unsolicited ORU message, the value in this field is the same as that in MSH-9 message control ID.
Example: The message, to which this message is a reply, was processed correctly:
MSA|AA|0155002273|This is a text message

4.12.3   MSA-3 – text message

This field can contain any text relating to the processing of the message to which this is a reply. In an unsolicited ORU message this field does not normally contain any data. In an ACK message, however, this field is important, especially if the acknowledgement code is not AA. This field is used in conjunction with the ERR segment to report errors.
Example:
MSA|AA|0155002273|This is a text message

4.13   ERR − error segment

The ERR segment is used to add error comments to acknowledgement messages.

Table 26: ERR error segment

Data element	Field	Cardinality / optionality (length)	Required for:	Comments
Error code	ERR-1	Required (80)	BusProc	Can only repeat in version 2.4

4.13.1   ERR-1 – error code and location

This field identifies an erroneous segment in another message. This field should be filled in as completely as possible. It is composed of the following components.

Table 27: Error code and location

Sub-component	Len	Type	Notes
<Segment ID>^	3	ST	Name of segment (eg, OBR)
<Set ID>	4	NM	The set ID of the offending segment.
<Field position>^	4	NM	This contains the index of the field causing the problem.
			Not used.
<Text>	51	ST	Text describing the error.

Variance to HL7 for version 2.1: HL7 allows this field to repeat.

Example: This shows that required field OBR-2 in the first occurrence of the OBR
segment in the message was missing:
ERR|OBR^1^2^^Required field missing

4.14   PID patient identification

Table 28: PID patient Identification

Data element	Field	Cardinality / optionality (length) Version 2.4	Cardinality / optionality (length) Version 2.1	Required for:	Comments	Future requirements
Patient identifier list	PID-3	Required (250)	Required (16)	BusProc	Type CK for version 2.1 but CX for version 2.4, which entails the addition of the identifier if not NHI. ESR will also check PID-2 if this is blank	NHI mandatory
Patient name	PID-5	Required (250)	Required (48)	PHAction, Legislation and BusProc	At least LastName^Givenname Repeats are ignored. Data type is PN for version 2.1 and XPN for version 2.4, which adds a component for name type.	
Date time of birth	PID-7	Required (26)	Required (8)	BusProc	Date of birth only required.	
Sex	PID-8	Required (1)	Required (1)	BusProc	M, F, I, U,O. The O is only valid for version 2.1 and is replaced by U in version 2.4.	
Ethnicity	PID-10	Required, 3 repeats only (250)	Optional, no repeats (1)	PHAction	Will accept '99' (not stated). HL7 version 2.1 does not allow repeats and field is of no practical use due to the 1 character restriction.	
Patient address	PID-11	Optional (250)	Optional, no repeats (106)	PHAction	1 repeat allowed in HL7 version 2.4 if actual address is different from mailing address. Extended in version 2.4 from AD type to XAD type. For version 2.1 a variation is encouraged to replace the mailing address with the physical address.	Mandatory

Data element	Field	Cardinality / optionality (length) Version 2.4	Cardinality / optionality (length) Version 2.1	Required for:	Comments	Future requirements
Home phone	PID-13	Optional (250)	Optional (40)	PHAction	Repeats are ignored in version 2.1. Extended in version 2.4 from a single string to a composite data type (XTN) with repeats. This allows the addition of email addresses, etc.	Mandatory
Business phone	PID-14	Optional (250)	Optional (40)	PHAction	Repeats are ignored. Extended in version 2.4 from a single string to a composite data type (XTN).	

Note: Only fields that are processed have been included in the above table. All others in the standards specification are ignored.

4.14.1   PID-1 – set ID

This field uniquely identifies each repeat of the PID segment. The value is 1 for the first PID segment in the message and is incremented for each subsequent PID segment.

Example: This is the first PID segment in this message:
PID|1||CBC2654^^^NZLMOH||DWARF^SLEEPY^E||19811019|F|||...

4.14.2   PID-2 – external patient ID

Note: This has been replaced by PID-3 but will be checked if PID-3 does not contain an NHI number.
This field contains the patient NZHIS HCU number. If not known, this field is to be left empty.

Example: This patient does not have an HCU number in PID-3:
PID|1|CBC2654| ||DWARF^SLEEPY^E||19811019|F|||...

4.14.3   PID-3 patient identifier list

This field should contain the patient NHI number. Normally only in exceptional circumstances (such as reporting sexual health cases) should any other identifier be used. If the NHI number is not supplied then a local number can be used. The assigning authority in this example (NZLMOH) differs from the examples in the standard which shows NHI. The example in the standard is incorrect and will be corrected.
Example:
PID|1||XXX9999^^^NZLMOH||DWARF^SLEEPY^E||19811019|F|||...

4.14.4   PID-5 – patient name

This field contains the patient's name. This is PN composite for version 2.1 and extended to an XPN for version 2.4, which provides a component to distinguish legal names from aliases etc. In the case of sexual health reporting, the name will be 'Confidential' to satisfy the required entry conditions.

Example:
PID|1||XXX9999^^^NZLMOH||DWARF^SLEEPY^E||19811019|F|||...

4.14.5   PID-7 – date of birth

This field contains the patient's date of birth and (optionally) the time of birth.
Example:
...||DWARF^SLEEPY^E||19811019|F|||215 GRANGE RD^OTUMOETAI^TAURANGA

4.14.6   PID-8 – sex

This field contains the patient's sex. The following values may be used. We strongly
recommend that one of the first two values be employed as far as possible.

Table 29:   PID-8 sex

Value	Meaning
M	Male
F	Female
U	The patient's gender is not known
I	Indeterminate. This should almost never be used unless it is a case of the patient's sex being impossible to determine. In all other cases use U for unknown.
O	Other gender (only valid for version 2.1).

Example:
...||DWARF^SLEEPY^E||19811019|M|||215 GRANGE RD^OTUMOETAI^TAURANGA

4.14.7   PID-10 – patient ethnicity

This field contains the ethnicity of the patient. This is only used in version 2.4.
Example:
... ||19811019|M||11|215 GRANGE RD^OTUMOETAI^TAURANGA

4.14.8   PID-11 – patient address

This field contains the mailing address of the patient. This is an AD data type for
version 2.1 and is extended to XAD for version 2.4, which provides for multiple address
types. The mailing address is always first, so the physical address should be second.
Example:
... ||19811019|M||11|215 GRANGE RD^OTUMOETAI^TAURANGA

4.14.9   PID-13– home phone number

This field contains home contact details of the patient.
Example: This is the phone number in version 2.1 format:
…|||215 GRANGE RD^OTUMOETAI^TAURANGA||09 123 4567

4.14.10 PID-14 business phone number

This field contains the business contact details of the patient.
Example: This is the phone and email address in version 2.4 format:
…||09 123 4567|^WPN^PH^^64^9^3456123^afternoons
only~^NET^Internet^fred@hisisp.co.nz

4.15 Notification identification

This segment (PV1) is not required until further notice. This is anticipated to be after
laboratory information systems have been adapted to cater for this requirement.

Table 30: Notification identification

Data element	Field	Cardinality / optionality (length) Version 2.4	Cardinality / optionality (length) Version 2.1	Required for:	Comments	Future requirements
Patient class	PV1-2	Required (1)	Required (1)	BusProc	Use 'N' not applicable	
Pre-admit number	PV1-5	Required (250)	Required (20)	PHAction, and BusProc		Notification number issued by the ESR or GP-linked tracing number.

Note: Only fields that are processed have been included in the above table. All others in the standards
specification are ignored.

4.15.1 PV1-2 – patient class

This field is used by some laboratory systems to classify patients. In the case of a
notification this is not applicable so the code 'N' is used.
Example:
PV1|N|||esr number

4.15.2 PV1-5– pre-admit number

See section 4.8 for more detail on the use of this field.
Example:
PV1|N|||GP order number

4.16 Observation request

Table 31: OBR observation request message

Data element	Field	Cardinality / optionality (length) Version 2.4	Cardinality / optionality (length) Version 2.1	Required for:	Comments	Future
Placer order number	OBR-2	Required (50)	Required (36)	BusProc, PHAction	Specimen/sample number from a practitioner. Created by laboratory when none supplied. This is a CM data type in version 2.1 and a more structured EI for version 2.4	Correct EI structure rather than various possibilities that exist at present.
Filler order number	OBR-3	Required (50)	Required (41)	BusProc, PHAction	Specimen/sample number preferably from the laboratory doing the test. This is a CM field version 2.1 and a more structured EI for version 2.4. Order numbers should be kept below 50 in length to ensure forward compatibility.	
Universal service ID	OBR-4	Required (250)	Required (52)	PHAction, Legislation		Implement NZPOCS and LOINC coding to replace local codes
Observation date	OBR-7	Required (26)	Required (14)	Legislation, BusProc and PHAction	Collection date for sample (used for onset date)	
Relevant clinical information	OBR-13	Optional (300)	Optional (300)	PHAction	Clinical info on patient or specimen	
Specimen received date	OBR-14	Required (26)	Required (14)	BusProc, PHAction	Date specimen received at laboratory	
Specimen source	OBR-15	Conditional (300)	See notes below for field 15 (300)	PHAction	The source and site from where the specimen was obtained. Required where clinically relevant.	
Ordering provider	OBR-16	Required (250)	Required (52)	BusProc, PHAction	Ordering practitioner. This is a CN data type for version 2.1 but XCN for version 2.4, but has the same required components. If this is not available because it has been referred by another laboratory, then the referring individual or laboratory should be used.	
Placer info (used in version 2.1) for facility code	OBR-18		To be supplied if possible (14)	BusProc, PHAction	Use HPI facility code as a string with no additional text.	Not required use OBR-46

Data element	Field	Cardinality / optionality (length) Version 2.4	Cardinality / optionality (length) Version 2.1	Required for:	Comments	Future
Filler info (used in version 2.1) for facility code	OBR-21		To be supplied if possible (60)	BusProc, PHAction	Use HPI facility code as a string with no additional text.	Not required use OBR-47
Results report/status change date time	OBR-22	Required (26)	Required (14)	BusProc and PHAction	Required for result corrections	
Diagnostic service Selector ID	OBR-24	Required (10)	Optional (10)	BusProc		
Result status	OBR-25	Required (1)	Required (1)	BusProc and PHAction	F C and X only	
Results copy to	OBR-28	Required (250)	Required (80)	BusProc and PHAction	Used to record public health unit case assigned to as well as the normal 'copies to'	
Placer supplemental service information	OBR-46	Required for version 2.4 (250)		PHAction	Placer facility code	
Filler supplemental service information	OBR-47	Required for version 2.4 (250)		PHAction	Filler facility code	

Note: Only fields that are processed have been included in the above table. All others in the standards specification are ignored.

4.16.1   OBR-2 – placer order number

This is the unique identifier given to this test by the placer of the order. In this case, this would be the identifier the practice management system of the GP assigned to this test. For version 2.1 this is made up of two components, as follows.

Table 32: OBR-2 placer order number

Sub-component	Len	Type	R/O	Notes
<GP practice ID>^	20	ST	O	
<GP order number>	15	ST	O	

Electronic ordering has not yet been implemented so the observation ID assigned by the practice management system is almost never known to the laboratory. Consequently this field is not commonly used. Some systems use null or a patient ID in this field. These are not recommended and the laboratory should issue a number. This number could be the filler order number in the interim.

Version 2.1 Example:
OBR|1|^1322.4|00/147871401000|4010^HAEMATOLOGY.....^L|

Version 2.4 Example:
OBR|1|1322.4^^F2J088^HF|00/147871401000|4010^HAEMATOLOGY.....^L|

For version 2.4 this is an order number and a name space. The name space contains the code in this example for DML but no description (to save space). HF is the code for the HPI that issued the code. The name space has been added because in this example the code has been issued by the laboratory rather than the GP (filler). The fact that it has been issued by the laboratory can be confirmed by comparing the code with the ordering facility code in OBR-46. The uniqueness of the number is assured by combining it with the facility code in OBR-46 if issued by the placer, or with OBR-47 if issued by the filler.

4.16.2   OBR-3 – filler order number

This is the unique identifier given to this test by the filler of the order. The filler of the order is always responsible for generating the message in this implementation. Consequently, the filler order number should always be known and used in the message.

Table 33:   OBR-3 filler order number

Sub-component	Len	Type	R/O	Notes
<Lab order number>^	20	ST	R	
<Lab ID>	20	ST	O	

Version 2.1 Example:
OBR|1|1322.4|00/147871401000|4010^HAEMATOLOGY.....^L|

For version 2.4 this is an order number and an optional name space. The uniqueness of the number is assured by combining it with the facility code in OBR-47.

4.16.3   OBR-4 – universal service ID

This field contains the code for the requested observation or test. This can be either a local or a universal code. Where possible a universal procedure identifier should be used. LOINC are to be used where possible. Local codes should only be used where no LOINC code is available.

Table 34: OBR-4 universal service ID

Sub-component	Len	Type	R/O	Notes
<Code>^	10	ST	R	
<Description >^	30	ST	R	
<Coding system>	10	ST	O	This field is not required but should always be filled. If the coding system is local, use 'L' in this field; otherwise use the full name of the coding system.

Example: This test was a complete haematology scan, code 4010 of a local coding system:

...|00/147871401000|4010^HAEMATOLOGY^L|R||2000011917...

4.16.4 OBR-7 – observation date/time

This field contains the clinically relevant date and time of the observation. This is the date and time the samples or specimens were collected, or the time the observation was made if the observation did not involve specimen collection.

Example: The specimen was collected on19 January 2000 at 5:52pm:

...|4010^HAEMATOLOGY^L|R||200001191752||...

4.16.5 OBR-13 – relevant clinical info

This field contains additional clinical information about the patient or specimen. It can be used to report clinical findings on requests for interpreted diagnostic studies. If a more structured form of information is required, a series of OBX segments should be used instead. Many messages do not use this field.
Example:

...|R||200001191752||||||Clinical Info|200001191752|EYE|...

4.16.6 OBR-14 – specimen received date/time

This is the time the specimen was received (or taken) by the laboratory to perform the test. In many cases this is the same as the observation date/time. HL7 requires the use of this field.
Example:

...|""|""||||Clinical Info|200001191752|EYE|2107^BARRETT^F|||...

4.16.7 OBR-15 – specimen source

This is the site from and method by which the specimen was obtained. For version 2.4 both the source and body site are recorded here. Table 35 has been added as an alternative to Table B2. It is anticipated that a new table will be added to the standard in the future which will better reflect New Zealand requirements.

It is expected that version 2.1 messages will contain this information in the body of the text if it is not available as a separate field. In some cases an additional NTE segment will be required to refine this field. For example, an NTE would be required to distinguish a left or right limb.

Table 35: 99NZESRSITE − body site

Value	Description	Value	Description
AB	abdomen	IUCDNB	intrauterine contraceptive deviceNebulized
AS	abscess	IVPA	IVPerianal
AC	acetabulum	IVLPERIN	IV linePerineal
AT	achilles tendon	JARA	jawRight Arm
AD	adenoid	JRAC	jointRight Anterior Chest
AM	amputation stump	KDRACF	kidneyRight Antecubital Fossa
A	ankle	KRD	kneeRight Deltoid
ATR	antral	LABRE	labia
ATWS	antral washings	LACREJ	lacerationRight External Jugular
AN	anus	LAPOD	laparotomyRight Eye
APX	appendix	LGRF	largeRight Foot
AA	area	LARRG	larynxRight Gluteus Medius
AR	arm	LFRH	leftRight Hand
ASC	ascites fluid	LRIJ	legRight Internal Jugular
ASP	aspirate	LERLAQ	lesionRt Lower Abd Quadrant
AUT	autopsy tissue	LNRLFA	lineRight Lower Forearm
AUTB	autopsy tissue:brain	LPRMFA	lipRight Mid Forearm
AUTC	autopsy tissue:cervix	LQRN	liquorRight Naris
AUTH	autopsy tissue:heart	LIRPC	liverRight Posterior Chest
AUTI	autopsy tissue:intestine	LORSC	lowerRight Subclavian
AUTK	autopsy tissue:kidney	LSCSRT	LSCSRight Thigh
AUTV	autopsy tissue:liver	LUERUA	luerRight Upper Arm
AUTL	autopsy tissue:lung	LTRUAQ	luken trapRight Upper Abd Quadrant
AUTS	autopsy tissue:spleen	LUMRUFA	lumenRight Upper Forearm
AUTT	autopsy tissue:trachea	LUMPRVL	lumpRight Vastus Lateralis
AX	axilla	LURVG	lungRight Ventragluteal
BK	back	LY	lymph
BAG	bag	LYN	lymph node
BAC	Bartholins cyst	MAM	mammary
BS	bed sore	MA	mandible
BI	bile	M	mass
BIO	biopsy	MAS	mastoid
BIOP	biopsy tissue:penis	MN	mediastinal node
BIOB	biopsy tissue:brain	ME	membrane
BIOC	biopsy tissue:cervix	men	meninges

Value	Description	Value	Description
BIOCO	biopsy tissue:colon	MSU	midstream urine
BIOD	biopsy tissue:duodenal	MILK	milk
BIOH	biopsy tissue:heart	MC	moisturising cream
BIOI	biopsy tissue:intestine	MO	mouth
BIOK	biopsy tissue:kidney	MU	muscle
BIOV	biopsy tissue:liver	NAIL	nail
BIOL	biopsy tissue:lung	NA	nappy
BIOS	biopsy tissue:spleen	NS	nasal
BIOT	biopsy tissue:trachea	NS	nasal swab
BIOW	biopsy tissue:wart	NPA	nasopharyngeal aspirate
BIT	bite	NP	nasopharynx
BLA	bladder	NC	natal cleft
BLI	blister	NK	neck
BL	blood	NE	nephrostomy
BO	body	NI	nipple
BOL	boil	ND	node
B	bone	NO	nodule
BOT	bottles	N	nose
BOW	bowel	NG	not given
BA	brain	OES	oesophagus
BR	breast	OP	operation
BM	breast milk	OL	oral
BRO	bronchial	PANC	pancreas
BAL	bronchial alveolar lavage	PS	paraspinal
BW	bronchial washings	PNY	paronychia
BRON	bronchoscope	PG	parotid gland
BN	burn	PT	patella
BUR	bursa	PEG	PEG
BU	buttock	PV	pelvic
CAE	caesarian section	PEN	penis
CAPD	CAPD	PAN	perianal
CT	catheter	PE	pericardial fluid
CSU	catheter specimen urine	P	perineum
CAH	catheter tip	PERIT	peritoneal
CU	catheter urine	PEDI	peritoneal dialysate
CAV	cavity	PER	peritoneum
CE	cellulitis	PN	pernasal
CN	central	PET	petechiae
CEN	central line swab	PH	pharynx
CSF	cerebrospinal fluid	PI	pilonidal
CL	cervical	PIN	pin
CX	cervix	PINN	pinna

Value	Description	Value	Description
CHE	cheek	PA	placenta
CH	chest	PLT	plate
CHP	chicken pox	PLA	pleural
CHI	chin	PCA	pleural aspirate
CLT	clitoral	PO	portacath
COL	colonised	PM	post mortem
CAW	colonoscope air/water	PRS	pressure sore
CB	colonoscope biopsy	PROD	product
C-ST	colostomy	PUB	pubic
CO	conjunctiva	PU	pus
CLC	contact lens case	PUST	pustules
CC	contents	RA	rash
CD	cord	R	rectal
CA	cornea	RE	redivac
CGPLT	cough plate	REN	renal
CV	CV line	RT	right
C	cyst	SA	sacrum
DV	device	SAL	salivary
DIS	device insertion site	SCB	scabies
DF	dialysis fluid	SCA	scald
DB	dog bite	SC	scalp
DS	donor site	SCAR	scar
DR	drain	SCR	scrotum
E	ear	SED	sediment
EZ	eczema	SM	semen
EFF	effluent	SEW	sewage
EB	elbow	SHELL	shellfish
EC	endocervix	SHN	shin
ET	endotracheal	SH	shoulder
EV	environment	SD	side
EPG	epiglottis	SIN	sinus
EQ	equipment	SK	skin
EX	exit site	SKLE	skin lesion
EY	eye	SKU	skull
EBR	eyebrow	SLUD	sludge
EL	eyelid	SOL	sole
FA	face	SO	sore
F	faeces	SPI	spinal
FE	femur	SE	spleen
FBT	fetal brain tissue	SP	sputum
FHT	fetal heart tissue	STN	sternum
FKT	fetal kidney tissue	STI	sting

Value	Description	Value	Description
FLT	fetal lens tissue	STOM	stomach
FST	fetal spleen tissue	ST	stump
FTT	fetal trachea tissue	SU	suprapubic
FIN	finger	SUT	suture
FN	fingernail	SW	swab
FI	fissure	SY	synovial
FIST	fistula	SF	synovial fluid
FLA	flank	TA	tampon
FP	flap	TAT	tattoo
FL	fluid	TE	tenckhoff
FVT	foetal liver tissue	TEST	testicle
FUT	foetal lung tissue	TH	thigh
FOS	foetal stomach	THR	throat
FOET	foetal tissue	THB	thumb
FD	fold	TIB	tibia
FOOD	food	TI	tip
FT	foot	T	tissue
FOR	forehead	TO	toe
FS	foreskin	TC	toeclefts
FO	fornix	TN	toenail
FRO	front	TG	tongue
FRTLO	frontal lobe	TONS	tonsils
GB	gall bladder	TOO	tooth
GA	gastric	TW	tower
GSS	gastroscope	TR	trachea
GST	gastrostomy	TASP	tracheal aspirate
GT	genital	TRY	tracheostomy
GL	gland	TRK	trunk
GF	graft	TU	tube
GS	graft site	UC	ulcer
G	groin	UM	umbilicus
GP	groin/perineum	UN	under
GUC	gut contents	UP	upper
HAE	haematoma	UR	urethra
HAEM	haemorrhoid	U	urine
HO	haemovac	UT	uterus
HA	hair	VAC	vaccine
H	hand	V	vagina
HD	head	VV	vagina/vulva
HEA	heart	VA	valve
HE	heel	VST	vasectomy
HKL	Hickman line	VT	vault

Value	Description	Value	Description
HV	high vaginal	VS	vesicle
HI	hip	VI	vitreous
HU	humerus	VL	vulva
HUM	humidifier	WA	wall
IM	impetigo	WT	wart
IND	index	WS	washings
IDC	indwelling catheter	WW	wastewater
INF	infected	WATER	water
IGC	inguinal canal	W	wound
IN	intestine	WR	wrist

Example:

...|'''''|''''||||Clinical Info|200001191752|EYE|2107^BARRETT^F|||...

4.16.8   OBR-16 – ordering provider

This contains the details of the GP or practitioner who ordered the test. Version 2.1 uses the CN data type and version 2.4 uses the XCN. Use the HPI number where this is available, otherwise the NZMC number.
Example:

...|200001181424|EYE|2107^BARRETT^F||F2J088 |7200^FORD^SAM|...

4.16.9   OBR-18 – placer facility code

This is the facility code (HPI) of the GP or laboratory placing the order. It is desirable for version 2.1.
Example:

...|200001181424|EYE|2107^BARRETT^F||F2J088 |7200^FORD^SAM|...

4.16.10   OBR-21 – filler facility code

This is the facility code (HPI) of the laboratory processing the order. It is desirable for version 2.1.
Example:

...| 2107^BARRETT^F||F2J088|7200^FORD^SAM||F5A123 |200001200920|…

4.16.11   OBR-22 – results report status change

This field holds the date the result status changed. For this implementation this will be the time the results were loaded into the laboratory system. Many systems have this field, which is the same as MSH-7 date/time of message.
Example:

...| 2107^BARRETT^F||F2J088 |7200^FORD^SAM||F5A123 |200001200920|…

4.16.12 OBR-24 – diagnostic service section ID

This field identifies which section of the laboratory was responsible for conducting the test
Example:
...| 2107^BARRETT^F||F2J088|7200^FORD^SAM|| F5A123 |200001200920||MCB|…

4.16.13 OBR-25 – observation result status

This field provides information about the status of the result. In almost all messages in this implementation the results are final and verified; therefore 'F' should be used. Other acceptable values are 'C' for a corrected result, or 'X' for deleting a result sent in error.
Example:
...| |F2J088|7200^FORD^SAM||F2J088 |200001200920||MCB||F|…

4.16.14 OBR-28 – results copy to

This field identifies which public health unit this case has been allocated to in addition to the normal "copies to". There is no implied order to the entries as the PHU entry can easily be identified by the fact that it is a facility rather than a person. The field is a CN type in version 2.1 and an XCN in version 2.4. However, in the New Zealand implementation the extra fields in the XCN data type are not used, so they can be treated as being identical. This field is intended to identify a person, but in this application it has been adapted to identify the public health unit associated with the case. The first component will hold the facility code. This will eventually be the HPI facility code, but in the interim will be a code from below. The second component will hold the public health unit facility name, and the ninth component will contain the value 'HF'.

Table 36: OBR-28 results copy to code

Public health unit office	OBR-28 public health unit office copy
Whangarei	episurvWH
Auckland	episurvAK
Hamilton	episurvHN
Whakatane	episurvWT
Rotorua	episurvRO
Tauranga	episurvTG
Gisborne	episurvGS
Napier	episurvNA
New Plymouth	episurvNP
Palmerston North	episurvPN
Wanganui	episurvWG
Wellington	episurvWN
Nelson	episurvNN
Blenheim	episurvBM

Public health unit office	OBR-28 public health unit office copy
Christchurch	episurvCH
Timaru	episurvTI
Greymouth	episurvGM
Dunedin	episurvDN
Invercargill	episurvIN

Example:
...|F2J088 |200001200920||MCB||F|||episurvAK^Auckland^^^^^^HF|…

4.16.15 OBR-46 – placer facility code

This is the facility code (HPI) of the GP or laboratory placing the order. It is mandatory for version 2.4. It does not form part of version 2.1, so will be reported in OBR-18 if possible.
Example:
…||MCB||F||| episurvAK^Auckland^^^^^^HF ||||||||||||||||||F2J088^^HF|F5A123^^HF

4.16.16 OBR-47 – filler facility code

This is the facility code (HPI) of the laboratory processing the order. It is mandatory for version 2.4. It does not form part of version 2.1, so will be reported in OBR-21 if possible.
Example:
…||MCB||F||| episurvAK^Auckland^^^^^^HF ||||||||||||||||||||F2J088^^HF|F5A123^^HF

4.17   Observation result

Initially it is expected that results will be in the form of a block of text with only additional OBX to carry the disease code. With the implementation of version 2.4 and adoption of coding systems, there will be a trend towards a more structured result.

Table 37: OBX− observation result message segment

Data element	Field	Cardinality / optionality (length) Version 2.4	Cardinality / optionality (length) Version 2.1	Required for:	Comments	Future
Set ID	OBX-1	Conditional (4)	Conditional (4)	BusProc	Identifier for repeats	
Value type	OBX-2	Required (2)	Required (2)	BusProc		
Observation identifier	OBX-3	Required (250)	Required (52)	PHAction	Local or LOINC codes	Repeat of this field will be used for the disease name. LOINC or NZPOCS codes to be used where available.

Data element	Field	Cardinality / optionality (length) Version 2.4	Cardinality / optionality (length) Version 2.1	Required for:	Comments	Future
Observation Sub-ID	OBX-4	Required if more than one result per test (20)	Required if more than one result per test (31)	BusProc		
Observation value	OBX-5	Required (limited only by total message size)	Required (6144)	Legislation and PHAction		
Units	OBX-6	Optional (250)	Optional (20)	PHAction		
Reference ranges	OBX-7	Optional (60)	Optional (60)	PHAction		
Observation result status	OBX-11	Required (1)	Required (1)	PHAction and BusProc	F, C and D values only	
Date/time of observation	OBX-14	Optional (26)		PHAction and BusProc	If OBR-7 is empty	
Producer's ID	OBX-15	Conditional (250)		Legislation and PHAction	Required for version 2.4 if results reported back from another laboratory that carried out the work.	
Responsible observer	OBX-16	Optional (250)		PHAction		

Note: Only fields that are processed have been included in the above table. All others in the standards specification are ignored.

4.17.1 OBX-1 – set ID

This field is used to identify repeats of this segment against each OBR segment. After every OBR the first OBX will have a set ID of '1', which will increment for each subsequent OBX segment. If OBX is more than the 6144 characters allowed, then the result can be split across two OBX segments with the same set IDs to satisfy the restrictions of version 2.1.

Example 1: Standard set IDs:
OBR|...
OBX|1|ST|4120^HAEMOGLOBIN^L||134|g/L|115-165||||F
OBX|2|ST|4030^DIFFERENTIAL^L|NEUS^Neut Seg|12.35|b/L|2.0-7.5|H|||F
OBR|...
OBX|1|ST|4120^HAEMOGLOBIN^L||134|g/L|115-165||||F

Example 2: Same result split across two OBX segments:
OBX|1|ST|4030^DIFFERENTIAL^L|1|NEUS^Neut Seg <and more text to 6144>...
OBX|1|ST|4030^DIFFERENTIAL^L|2|this completes the result above.

4.17.2 OBX-2 – value type

This field contains the format of the observation value in the OBX (field 5) and should always be filled. The current implementation only accepts the following values for version 2.1 messages. Version 2.4 messages can contain any value supported by the standard.

Table 38: OBX-2 value type

Value	Meaning
ST	OBX-5 contains an HL7 string. This is the default.
TX	OBX-5 contains HL7 text, which is a string intended for user display.
FT	OBX-5 contains HL7 text, including formatting characters. Please see HL7 version 2.4, section 2.4.6, for information on the use of escape sequences and formatting characters.
CE	See detail in OBX-3 below

Variance to HL7: HL7 this field is conditionally required.
Variance to HL7: This field will contain ST even if the result is numeric. (As in the example).

Example:
OBX|1|ST|4120^HAEMOGLOBIN^L||134|g/L|115-165||||F

4.17.3 OBX-3 – observation identifier

This field contains a unique identifier for the specific observation this result reports. This may be the same as OBR-4 universal ID if there is only one result to report for that test. This may be either a local code or a universal identifier. LOINC or NZPOCS codes are to be used in this field wherever possible.

Table 39: OBX-3 observation identifiers

Sub-component	Len	Type	R/O	Notes
<Code>^	10	ST	R	
<Description >^	30	ST	O	
<Coding system>	10	ST	O	This field is not required but should always be filled. In some cases the value is obvious and can be omitted; for example, when the source is one HL7 table specified in the standard. If the coding system is local, use 'L' in this field; otherwise use the name of the coding system (ie, 'LN' for LOINC).

Example: This is a local code for the haemoglobin count:
OBX|1|ST|4120^HAEMOGLOBIN^L||134|g/L|115-165||||F

4.17.4   OBX-4 – observation sub-ID

This field is used to distinguish between multiple OBX segments with the same observation ID organised under one OBR.

4.17.5   OBX-5 – observation value

This field contains the value observed – the result of the test. This may be as simple as a numerical value, or it may contain detailed text describing the outcome. Information in this field should relate directly to the result. Notes on the result should be sent in separate notes and comments segments.
Variance to HL7: HL7 allows 64k to be sent in this field.
Example 1: Simple observation value:
OBX|1|ST|4120^HAEMOGLOBIN^L||134|g/L|115-165||||F

Example 2: Text observation value; note the value in OBX 2:
OBX|1|FT|…|THROAT SWAB^ ^CULTURE:Normal flora|...

Example 3: Diagnosis; note the value in OBX 2:
OBX|1|CE|…|ANTH^Anthrax^99NZESRDC|...

4.17.6   OBX-6 – units

This field specifies the measurement units of the fields in this segment, including results and reference ranges and any other additional data. See Pathology standards for the regulations for legal units and prefixes.

Example: The units for the haemoglobin test result given last field is grams per litre:
OBX|1|ST|4120^HAEMOGLOBIN^L||134|g/L|115-165||||F

4.17.7   OBX-7 – reference ranges

This is the reference range of the test conducted. The reference range is the range that a normal test will fall into. This should be in one of the following formats.

Table 40:   OBX-7 reference ranges

Format	Notes
Lower limit–upper limit	This is the most common format.
>Lower limit	Use this only if there is no upper limit.
<Upper limit	Use this only if there is no lower limit.

Example: Normal results for the haemoglobin are from 115 to 165 g/L:
OBX|1|ST|4120^HAEMOGLOBIN^L||134|g/L|115-165||||F

4.17.8   OBX-8 – abnormal flags

If the result of the test is abnormal, the abnormality should be communicated in this field. The most common values for non-microbiology tests are as follows. Please consult Pathology standards for a comprehensive list of acceptable values for all tests.

Table 41: OBX-8 abnormal flags

Value	Meaning
L	Low
H	High
LL	Below lower panic limit
HH	Above upper panic limit
N	Normal; applies only to non-numeric values

L, H and N are by far the most common values used.

Example 1: Because this result is in the normal reference range and the result is numeric, no value is sent:
OBX|1|ST|4120^HAEMOGLOBIN^L||134|g/L|115-165||||F

Example 2: Value for the test is abnormally high:
OBX|1|ST|0060^Glucose^L||9.0|mmol/L|3.0-6.1|H|||F

4.17.9   OBX-11 – observation result status

This field provides information about the status of the result for the test described in OBX-3. In almost all messages in this implementation the results are final and verified; therefore F should be used. Other acceptable values are as follows.

Table 42: OBX-11 observation result status

Value	Meaning
C	Correction, replaces final result.
D	Delete, currently held result with same ID. (Note: the complete OBR should be deleted with an X and the remaining correct results resent.)
P	Provisional Result
F	Final result.

Many practice management systems will not support the functionality of some of these values. The sender and recipient will need to agree on the finer points of the functionality of these results. For example, is a D always going to be followed up with another F (final result)? Will unverified results be accessible, etc.?

Example: This result is final:
OBX|1|ST|4120^HAEMOGLOBIN^L||134|g/L|115-165||||F

4.18   NTE − note segment

The NTE segment is used for sending notes and comments. Typically in this implementation it will be used to supply additional information about a result.

Table 43: NTE note segment

Data element	Field	Cardinality / optionality (length)	Required for:	Comments
Set ID	NTE-1	Required for version 2.4 (4)	BusProc	
Source of comment	NTE-2	Optional (8)	BusProc	
Comment	NTE-3	Required (120 for version 2.1, 64k for version 2.4)	BusProc	May repeat in version 2.4
Comment type	NTE-4	Optional (250)	BusProc	Only used in version 2.4; will be disregarded in this implementation

Note: Only fields that are processed have been included in the above table. All others in the standards specification are ignored.

4.18.1   NTE-1 – set ID

This field is used where there is more than one NTE segment in a message. The number system used is as follows.

If the comment is greater than 120 characters in length, it should be split across multiple NTE segments and the same set ID should be used for all of them. After each OBX segment the first NTE segment will have a set ID of 1. If more comments are required, the subsequent set IDs will increment the set ID by 1 for each unrelated NTE segment.

Although officially this field is optional, it should always be filled in so that accurate debugging information can be returned and processed.

Example 1: The following example shows the set IDs from two unrelated comments for a single OBX segment:
OBX|…
NTE|1|L|Moderate neutrophilic leucocytosis.
NTE|2|L|Mild thrombocytopenia.

Example 2: The following example shows the set IDs from two unrelated NTE segments for two different OBX segments:
OBX|…
NTE|1|L|Moderate neutrophilic leucocytosis.
OBX|…
NTE|1|L|Poliomyelitis antibodies not detected

Example 3: The following example shows the set IDs from the same comment split across two NTE segments:
OBX|…
NTE|1|L|Laboratory test performed as requested… <to 120 characters>
NTE|1|L|and completed but no antibodies detected.

4.18.2 NTE-2 – source of comment

This identifies the source of the comment. In this implementation the laboratory is almost always the source of the comment, and the field usually contains L.

Table 44: NTE-2 source of comment

Value	Meaning
L	The filler was the source of the comment. This corresponds to the laboratory.
P	The placer system was the source of the comment. This corresponds to the GP in most cases.
O	Other system.

Example: The laboratory entered the comment:
NTE|1|L|Moderate neutrophilic leucocytosis.

4.18.3 NTE-3 – comment

This contains the text of the comment.

Example:
NTE|1|L|Moderate neutrophilic leucocytosis.

4.19 Examples

All data in these messages is completely fictitious.

4.19.1 Version 2.1 message

MSH|^~\&|DIAGNOSTIC|DMLTESTS|EPISURV|endmsesr|200712121359||ORU|00963425|P|2.1
MSA|AA|0096342512
PID|1||LLX0159||TESTING^Rosemary^||19551225|F|||215 GRANGE RD^OTUMOETAI^TAURANGA||09 123 4567|09 123 9876
PV1||N|NA||esr123456
OBR|1|^1322.4|00/147871401000|3930^Cerebrospinal Fluid^L|R||200711261256|||||||Headache and fever|200711261256|CSF|07315^TESTDR^JOCK||F2J088|13005^H^Medical|13005^H^Medical|F2A099 |200711281256||MCB|C|||episurvAK^Auckland^^^^^
OBX|1|CE|29308-4^Diagnosis^LN||MEND^Neisseria meningitidis invasive disease^99NZESRDC||||||F
OBX|2|FT|3930^CSF^L|| Cerebrospinal fluid\.br\ Clear straw-coloured.\.br\ Gram stain\.br\ Small numbers of white cells seen.\.br\ No organisms seen\.br\ Culture\.br\ Growth of Neisseria meningitidis\.br\ SENSITIVE TO: Penicillin, Ceftriaxone\.br\ Neisseria meningitidis is an uncommon cause of acute bacterial meningitis in adults.\.br\ Systemic antibiotic therapy is recommended.\.br\ Meningococcal meningitis must be reported to the Medical Officer of Health.||||||C

This result is an amended result, where the diagnosis has not changed but the result report has been amended. The diagnosis has been reported as a structured segment and the remainder as formatted text. Refer to the messaging standard for an explanation of the formatting characters.

4.19.2   Version 2.4 message

MSH|^~\&|DIAGNOSTIC|DMLTESTS|EPISURV|endmsesr|200712121359||ORU|00963425|P|2.4
PID|1||LLX0159^^^NZLMOH ||TESTING^Rosemary^||19551225|F||11|215 GRANGE RD^OTUMOETAI^TAURANGA||||^PRN^PH^^64^9^3454567||^WPN^PH^^64^9^3456123^afternoons only~^NET^Internet^fred@hisisp.co.nz
PV1||N|||esr123456
OBR|1|1322.4^^F2J088^HF|0714380051433200^|3930^Cerebrospinal Fluid^L^RNZ7101^Culture (Microbiology)^NZPOCS|R||200711261256||||||Headache and fever|200711261256|CSF^^Lumbar puncture^|07315^TESTDR^JOCK||||13005^H^Medical|F2A099^Hospital Lab^HF|200711281256||MCB|C|||episurvAK^Auckland^^^^^^^HF ||||||||||||||||||||F2J088^^HF|F5A123^^HF
OBX|1|CE|29308-4^Disease^LN||MEND^Neisseria meningitidis invasive disease^99NZESRDC||||||F
OBX|2|CE|3930^CSF^L^31208-2^Specimen Source^LN||Cerebrospinal fluid||||||F
OBX|3|CE|^^^XNZ7301^Gross Observation^NZPOCS||Clear straw-coloured.||||||F
OBX|4|CE|^^^664-3^Microscopic Observation^LN|1|Small numbers of white cells seen.||||||F
OBX|5|CE|^^^664-3^Microscopic Observation^LN|2|No organisms seen.||||||F
OBX|6|CE|^^^6463-4^Bacteria Identified^LN||Growth of Neisseria meningitidis.||||||F
OBX|7|CE|^^^18964-7^Penicillin^LN||S||||||F
OBX|8|CE|^^^18895-3^Ceftriaxone^LN||S||||||F
NTE|1|L|Neisseria meningitidis is an uncommon cause of acute bacterial meningitis in adults.<cr>
NTE|1|L|Systemic antibiotic therapy is recommended.<cr>
NTE|1|L|Meningococcal meningitis must be reported to the Medical Officer of Health.

This result is an amended result where the diagnosis has not changed but the result report has been amended. The diagnosis has been reported as a structured segment and the remainder as formatted text. Refer to the messaging standard for an explanation of the formatting characters.

4.19.3   Two diseases reported on the same test

In this case, two OBX segments are sent before the test result. Note the numbering in OBX-1.

OBR|…
OBX|1|CE|29308-4^disease^LN|1|CRYP^ Cryptosporidiosis ^99NZESRDC||||||F
OBX|2|CE|29308-4^disease^LN|2|GIAR^ Giardiasis^99NZESRDC||||||F
OBX||FT|…

5 Other Legal Considerations

5.1 Privacy

Although notification under the Health Act 1956 allows for named patient information to be shared for the purpose of protecting the public health, all health-related information relating to individuals must be adequately protected.

In the near future (mid-2008), the addition of conditions such as chlamydia, gonorrhoea and syphilis may require 'unnamed' data to be captured. Unnamed notifications are likely to be linked with a patient's NHI (a unique identifier) and so are not anonymous. For this reason, additional security provided for through an electronic system, such as role-based security (ie, blocking certain information from general view) will be used to ensure individual privacy. Access to patient-level data for all other diseases and conditions will be restricted to the staff at the responsible (local) public health unit. All identifiable information will be blocked from the view of 'national users'.

Note: AIDS notifications are compiled by the AIDS Epidemiology Group at the University of Otago, Dunedin. Two reference laboratories perform the confirmatory testing for HIV and report positive results in a coded form to the AIDS Epidemiology Group, via the responsible public health unit. AIDS notifications should not be entered into or sent to EpiSurv.

CJD notifications should not be entered into or sent to EpiSurv. CJD notifications are to be send to the CJD register at the University of Otago by the responsible public health unit.

5.2 Security

As part of phase 1 it is expected that both laboratories and public health unit users will connect and/or send messages via the Health Network. Public health unit users will require a log-in name and password to access the system. Security will allow public health units to view and report on their local data in detail, and view and report on national data at a summary level.

Laboratories, public health units and ESR must use the New Zealand Health Network to exchange data through the ENDMS.

5.3 Urgency and acknowledgement

Existing manual systems, such as fax (auto-receipt) and telephone, mean that a notifier is aware that a notification has been received at a public health unit. In moving to electronic notification, acknowledgement that a notification has been received (or rejected) will be required. This function may be discharged either by the receiving application itself or an intermediary message broker.

For some conditions, it is particularly important that a notification is received and actioned as soon as possible. For laboratories reporting electronically, professional judgement should be exercised in relation to the reporting of results that are likely to require urgent action by the public health unit. In such circumstances, phoning through the results as well as sending the results electronically is recommended.

6   Related Documents

The documents listed below have been referred to in the development of this guide. They may provide clarification of this guide, if required.

6.1   Relevant standards

HISO: 10011.1. *Referrals, Status, and Discharge Business Process.* Wellington: Ministry of Health, 2007.
HISO: 10011.2. *Referrals, Status, and Discharge Messaging Standard.* Wellington: Ministry of Health, 2007.
HISO: 10011.3. *Referrals, Status, and Discharge Implementation Guide.* Wellington: Ministry of Health, 2007.

HISO: 10008.1. *Pathology and Radiology Messaging Standard.* Wellington: Ministry of Health, 2007.
HISO: 10008.2. *Pathology and Radiology Implementation Guide.* Wellington: Ministry of Health, 2007.

HL7 Standard version 2.4 − An Application Protocol For Electronic Data Exchange in Healthcare Environments. Ann Arbor: Health Level Seven Inc.
Health Level Seven (HL7). *Standard for Electronic Data Exchange in Healthcare Environments.* Version 2.1 (HL7 2.1). Ann Arbor: Health Level Seven Inc.

HISO: 10005. *HPI Data Set.* Wellington: Ministry of Health, 2004.
HISO: 10006. *HPI Code Set.* Wellington: Ministry of Health, 2004.

HISO 10004. *NZPOCs.* Wellington, Ministry of Health, 2005.

6.2   ISO

ISO 3166: ISO 3166-1:1997, Codes for the Representation of Names of Countries and Their Subdivisions: Part 1: Country codes.

6.3   Other publications

SNZ HB 8169:2002. Health Network Code of Practice (Amendment 1 2006).
Health Information Privacy Code 1994.

6.4   Ministry of Health, health intranet standards

http://www.hin.moh.govt.nz/pages/standards.htm