

# HL7 Hong Kong FHIR® Connectathon Series 2025

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SIXTH CONNECTATHON

24 MAR 2025

EXECUTIVE RM 119, 1/F, HKPC BUILDING, 78 TAT CHEE AVENUE, KOWLOON, HONG KONG

# Welcoming remarks

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By

Mr Pascal Tse (Vice Chairman, HL7 Hong Kong)

# Welcoming remarks

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**Topics: Laboratory Record (Microbiology) & Radiology Examination Record**

Programme	Speaker
<b>Update on eHealth+</b>	<b>Louise Wong</b> Health Informatics Analyst I, HA
<b>Dataset briefing for Laboratory Record (Microbiology)</b>	<b>John Mok</b> Health Informatician, HA
<b>Dataset briefing for Radiology Examination Record</b>	<b>Rex Yiu</b> Health Informatics Analyst I, HA
<b>FHIR mapping for Laboratory Record (Microbiology) &amp; Radiology Examination Record</b>	<b>Michael Cheung</b> Systems Manager, HA
<b>Open discussion</b>	

- Fully supported by Electronic Health Record Office

# Update on eHealth+

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By

Ms Louise Wong (Health Informatics Analyst I, Hospital Authority)

# Update on eHealth+ Development





# eHealth+ Development Plan and Progress

7

# eHealth+ Development



Care Coordination



Cross-sector Collaboration



Health Surveillance



Smart Health Ecosystem



Active Health Management

# Four Strategic Directions

## One Health Record

Deposit all health records of residents into personal accounts



## One Care Journey

Coordinated healthcare journey to traverse across different levels and tiers of the healthcare system



## One Digital Front-door to Empowering Tools

Encourage personal health management and monitoring



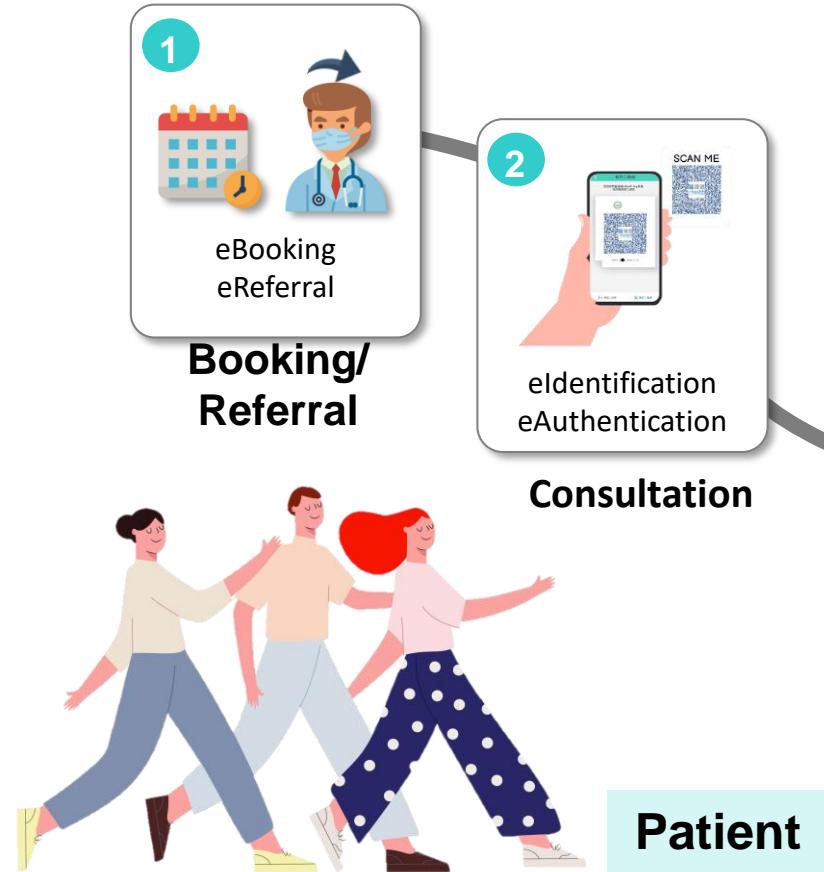
## One Health Data Repository

Consolidate health data to support medical and clinical research and health policy formulation



9

# Nine Core Functions



Identification and Service Matching

Receiving Care

After Care

## 6 Portable eHealth Record

Follow-up with non-local healthcare providers

## 7 eHealth Manager

Health process management

## 8 eHealth Tracker

Analytics and monitoring

## 9 eHealth Life

Health activities

# One Health Record



## Boost registration

1. Increase registration outlets, e.g. post offices, GBA institutions
  2. Special registration programme
  3. Mandatory registration subsis' prog
- eHealth for
- 

## Technical support



1. Simplify compliance procedures
2. Self-service testing platform



1. User group engagements

## Industry partnerships



Cross-boundary Health Record



Personal Folder

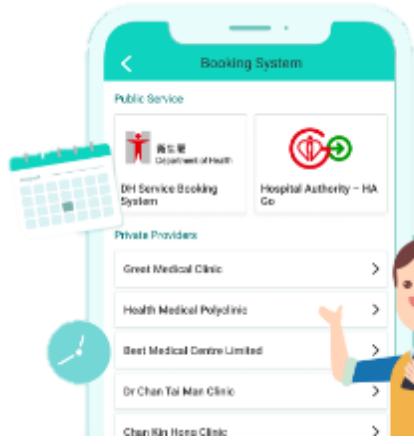
# One Care Journey

**One centralised platform to support primary healthcare services and programmes**



1  
2

# One Digital Front-door to Empowering Tools



eBooking

The eLaboratory Report mobile application interface shows a woman holding a smartphone. On the screen, there is a table of laboratory results from Alice Ho Miu Ling Nethersole Hospital, dated 2024/09/26. The results include:

化驗項目 (參考值)	結果 (單位)
Sodium (136-145)	142 mmol/L
Potassium (3.5-4.5)	4.1 mmol/L
Bicarbonate (23-26)	3.7 mmol/L
Glucose (55-99)	53 umol/L
Total (35-52)	72 g/L
Albumin (35-52)	48 g/L
Globulin (18-38)	24 g/L
Bilirubin, Total (<22)	6 umol/L
Alkaline Phosphatase, Total (42-147)	42 U/L
Alanine Aminotransferase (<47)	14 U/L

Below the table are two small images of laboratory test strips labeled 'TESTER VITAMINAL JAHUAN'.

eLaboratory Report



The e+Life Health Challenge Platform mobile application interface shows a woman walking outdoors. The screen displays a challenge titled '遊戲' (Game) with a progress bar and a message: '立即與家人一起參與遊戲吧！以二維碼協助16歲以下家人登入' (Join your family to play the game! Use a QR code to help 16-year-old family members log in). Another challenge titled '拯救運動寶寶' (Save Sports Baby) is shown with a blue alien character and a button '準備好展開救援？' (Are you ready to rescue?). The bottom of the screen has navigation icons for '主頁' (Home), '活動資訊' (Activity Information), and '我的' (My).

e+Life Health Challenge Platform



Upcoming....

# One Health Record

## Encourage citizen's participation

1. Newborns and minors registration on eHealth App
2. Extend mandatory registration to subsidised programmes

## Encourage data deposit by HCPs

3. WM and CM connectivity / pilot scheme
4. eHealth+ certification scheme
5. Ongoing technical support for HCPs, e.g. CM Hospital, laboratories



# One Care Journey



Facilitate sharing of **medication records** in different healthcare settings, e.g. RCHs



Expand and enhance **cross boundary functions**



基層醫療指南  
Primary Care Directory



疫苗接種計劃  
Vaccination Schemes



醫療券

Health Care Voucher  
The Government of the Hong Kong Special Administrative Region



大醫院  
計劃



門診協作  
General Outpatient Clinic  
Public-Private  
Partnership Programme

Develop  
Health  
Operation Platform to  
support  
all  
government  
subsidised  
programmes

Strategic  
Service  
Platform to  
support  
all  
government  
subsidised  
programmes

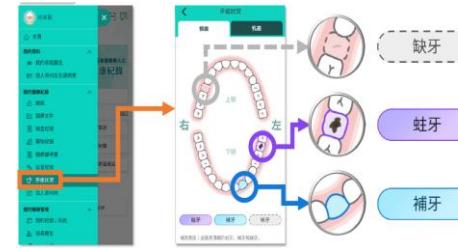


1  
6

# One Digital Front-door to Empowering Tools



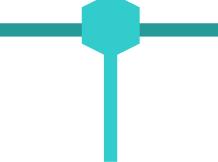
eReports and elmaging



Access to dental records



eMedical certificate (DH and HA)



Access to CM records

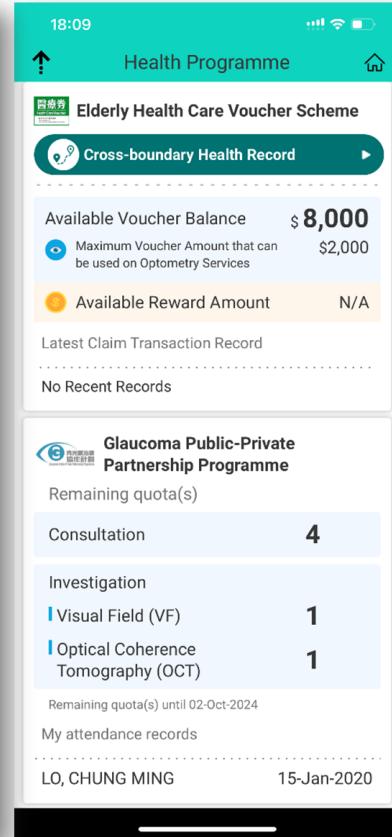
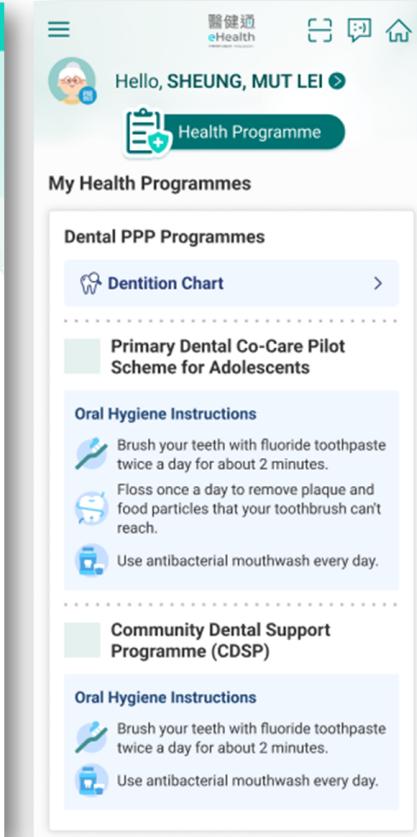
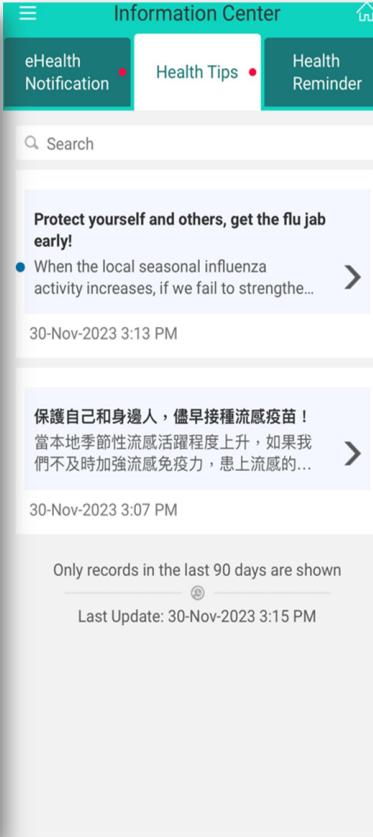
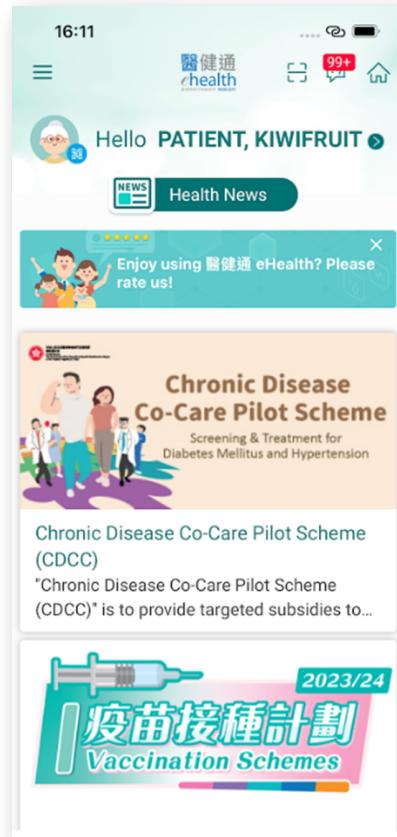


Enhanced eBooking





# One Digital Front-door to Empowering Tools



Active Patient Engagement

Timely Programme Promotion

Streamlined Enrolment

Seamless Access to Care

Tailored Health Management

# Thank You



# Dataset briefing for Laboratory Record (Microbiology)

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By

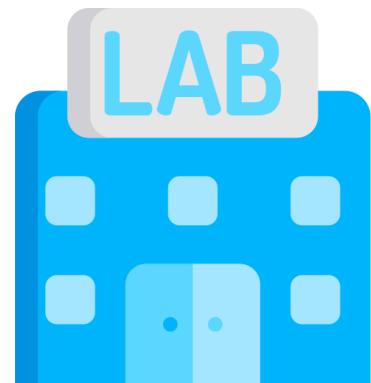
Mr John Mok (Health Informatician, Hospital Authority)



香港特別行政區政府 HKSARGOV

# **Introduction on Laboratory Data Standards for Microbiology & Virology Records**

# Laboratory Record Standards and Data Sharing Approaches



**Level 3**

Report Image + Standardised Data

**Level 2**

Report Image + Local Data

**Level 1**

Report Image

醫健通

eHealth

香港特別行政區政府 HKSARGOV



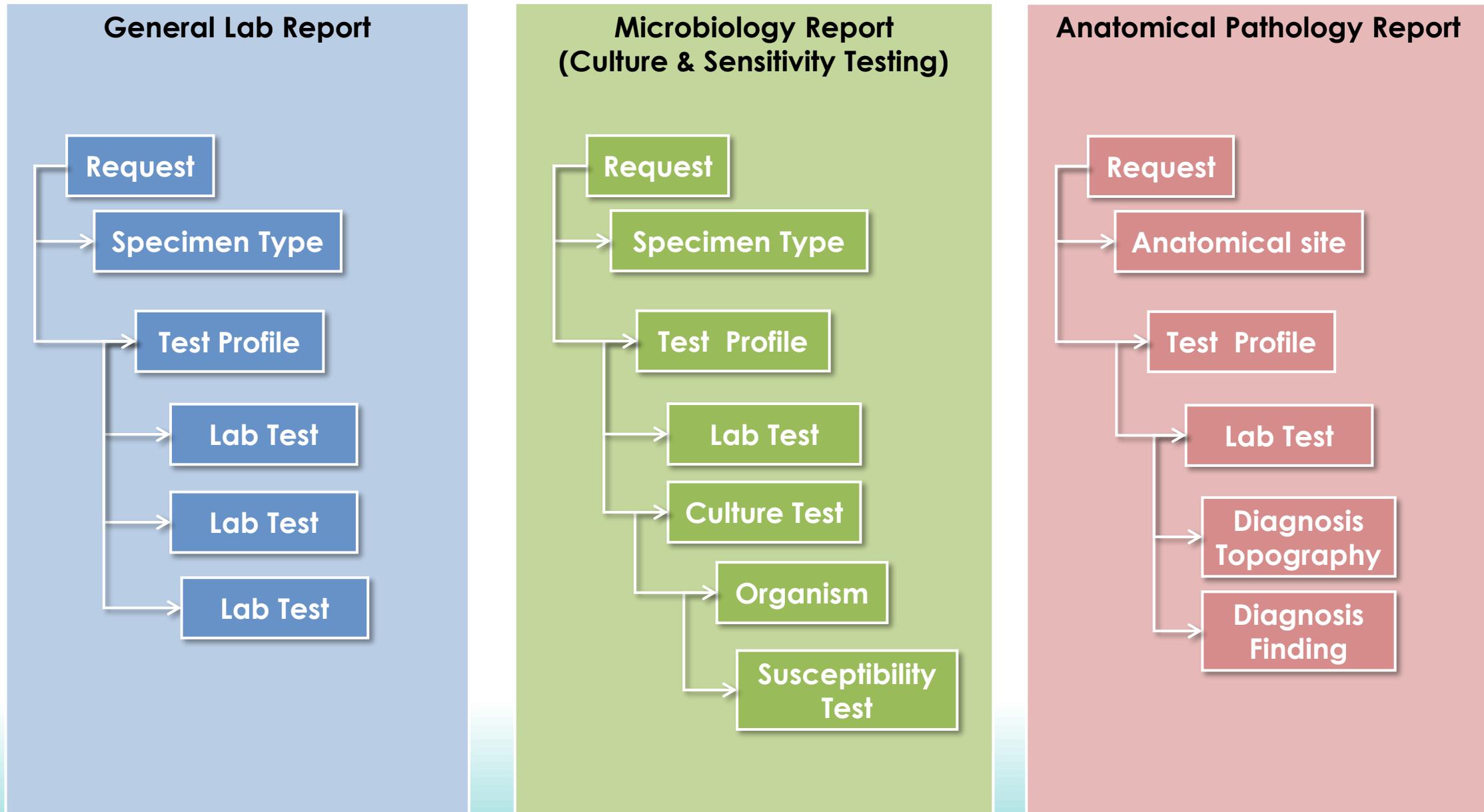
**Lab Record Standards**

**General Lab**

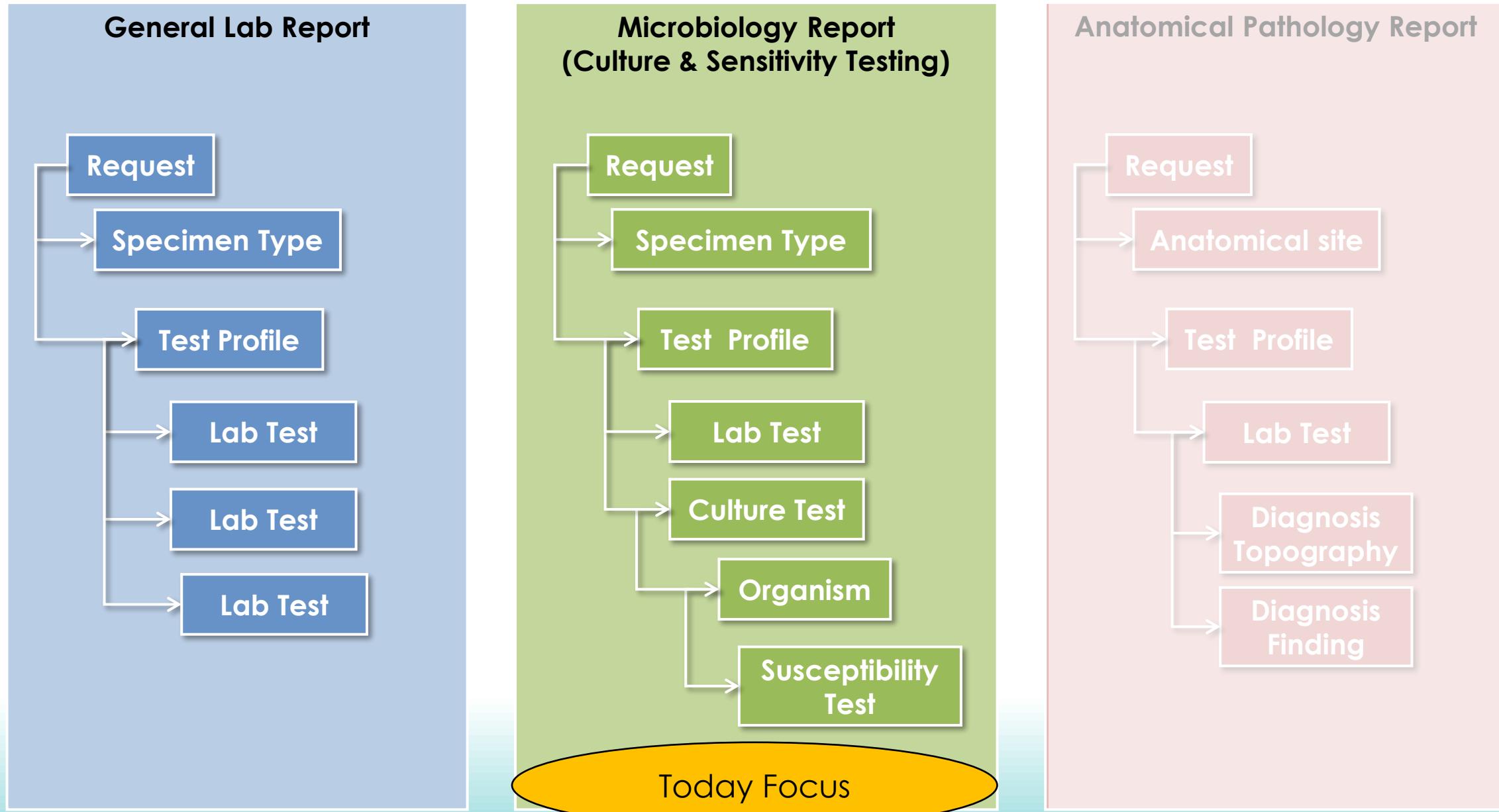
**Microbiology**

**Anatomical Pathology**

# Tailored Record Standards for Varied Lab Reporting Models



# Tailored Record Standards for Varied Lab Reporting Models



# Data Sharing = Report Image + Structured Data (Local Data / Standardised Data)

ABC Laboratory

PATIENT Lab No. : 23C56999  
Requester : Dr Chan Tak Man Clinic

CLINICAL CHEMISTRY 臨床生化學

Specimen Type:	Blood	Specimen Collection Time:	15/Jul/2017 @ 07:14	Specimen Received:	15/Jul/2017 @ 07:34	
Tests	Results	Unit	Ref. Range	Results	Unit	Ref. Range
<b>Renal Function Tests 腎臟功能檢測</b>						
Sodium	145	mmol/L	136 – 145	145	meq/L	136 – 145
Potassium	3.8	mmol/L	3.5 – 5.1	3.8	meq/L	3.5 – 5.1
Chloride#	106	mmol/L	98 – 107	106	meq/L	98 – 107
Bicarbonate#	22	mmol/L	22 – 29	22	meq/L	22 – 29
Urea	7.7	mmol/L	2.9 – 8.2	22	mg/dL	8 – 23
Creatinine	61	μmol/L	44-80	0.69	mg/dL	0.50 – 0.90
<b>Glucose fasting</b>	<b>8.7</b>	↑ mmol/L	3.9 – 6.0	<b>157</b>	mg/dL	70 – 108

+ Local Data (Level 2)

Continued on Page 2....

Final Report

Priority: ROUTINE on 15/Jul/2017 @ 11:44

Tests marked # are not included in the scope of accreditation by HKAS under the HKLAS scheme.  
\*\*\*\*\* ARCHIVE \*\*\*\*\* The above stated reference ranges have been established to be age & gender-specific.  
HKAS has accredited Seven-Day Adventist Corporation (HK) Limited-Clinical Laboratory, Adventist Health (Reg. No. HKLAS 8258) under HKLAS for performing specific examinations as listed in its scope of accreditation.

Clinical Chemistry CLAB-MOE01b



## Report Image (Level 1)

Map to

eHR Recognised Terminology

+ Standardised Data (Level 3)

General Lab Report Example

# eHR Recognised Terminology for Standardising Laboratory Data

International  
Reference Terminology



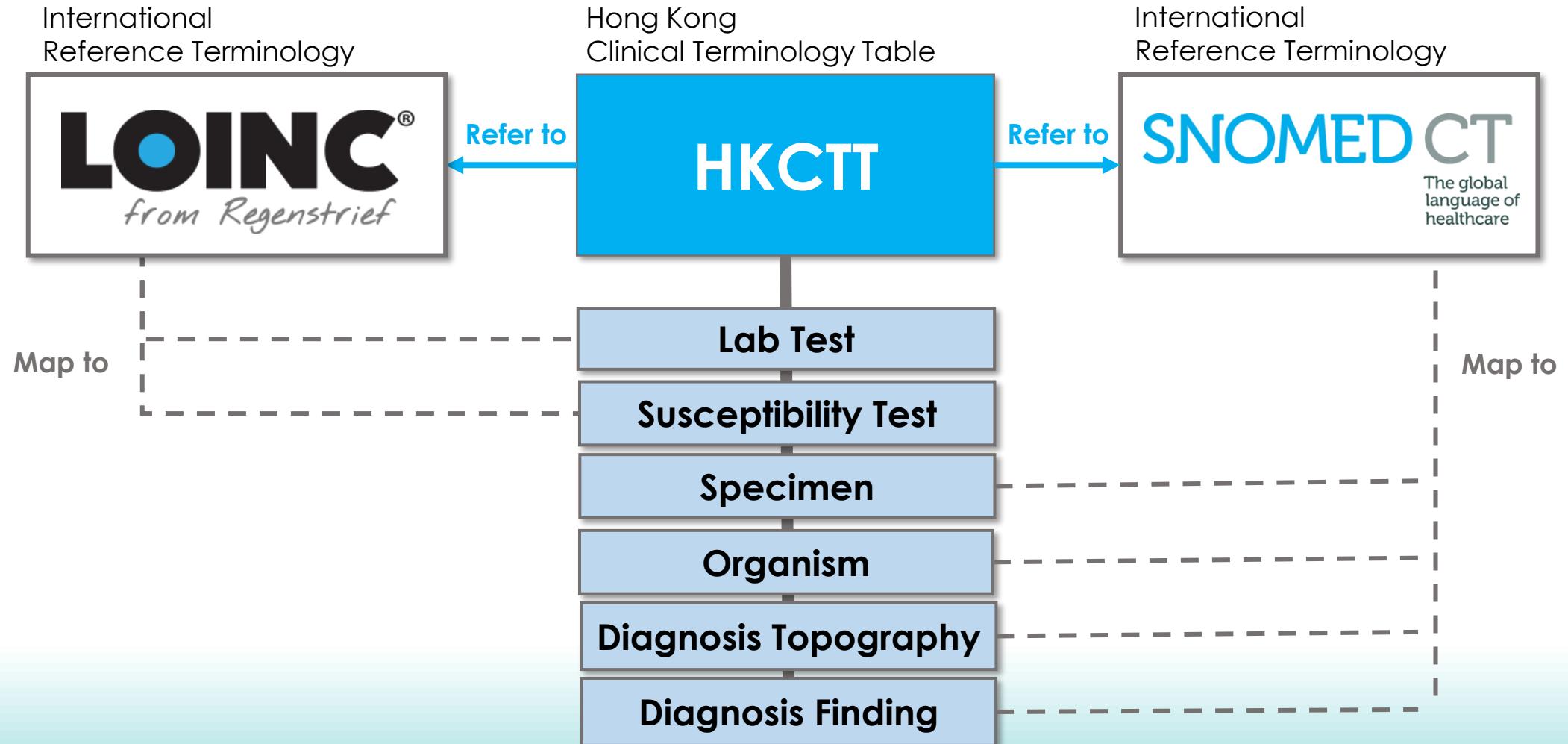
Hong Kong  
Clinical Terminology Table



International  
Reference Terminology



# eHR Recognised Terminology for Standardising Laboratory Data



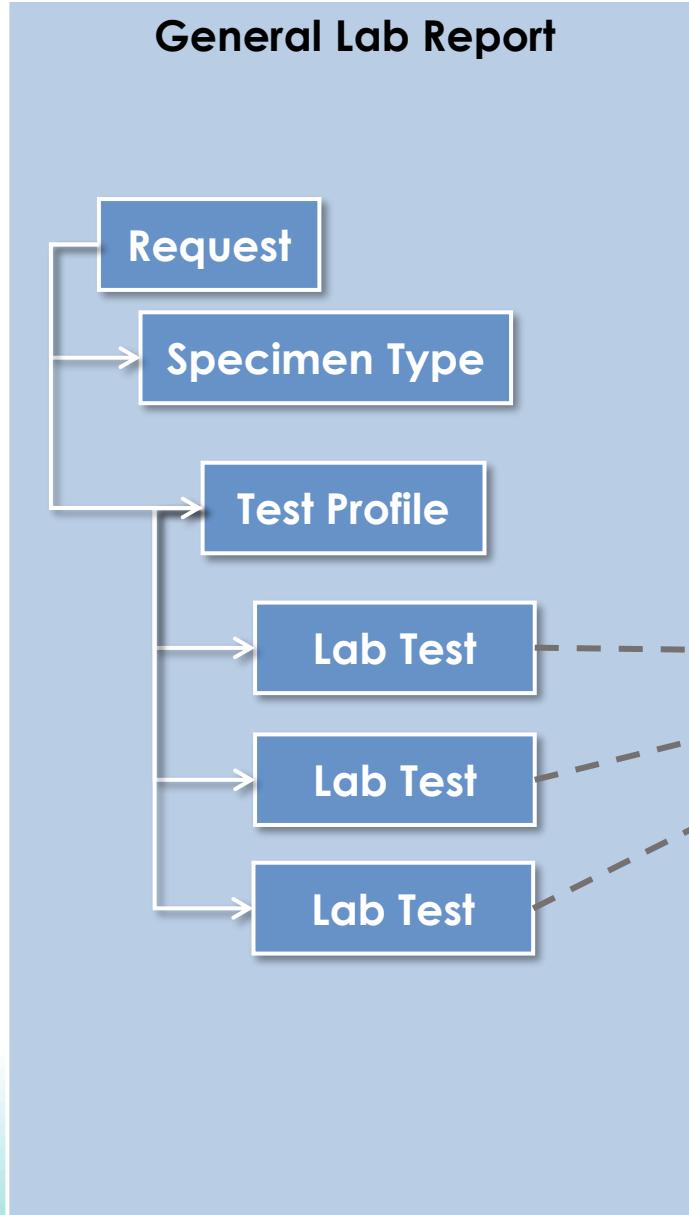


## General Laboratory Data Sharing

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### LABGEN Dataset Highlight

# General Lab Data Model & Terminology Binding



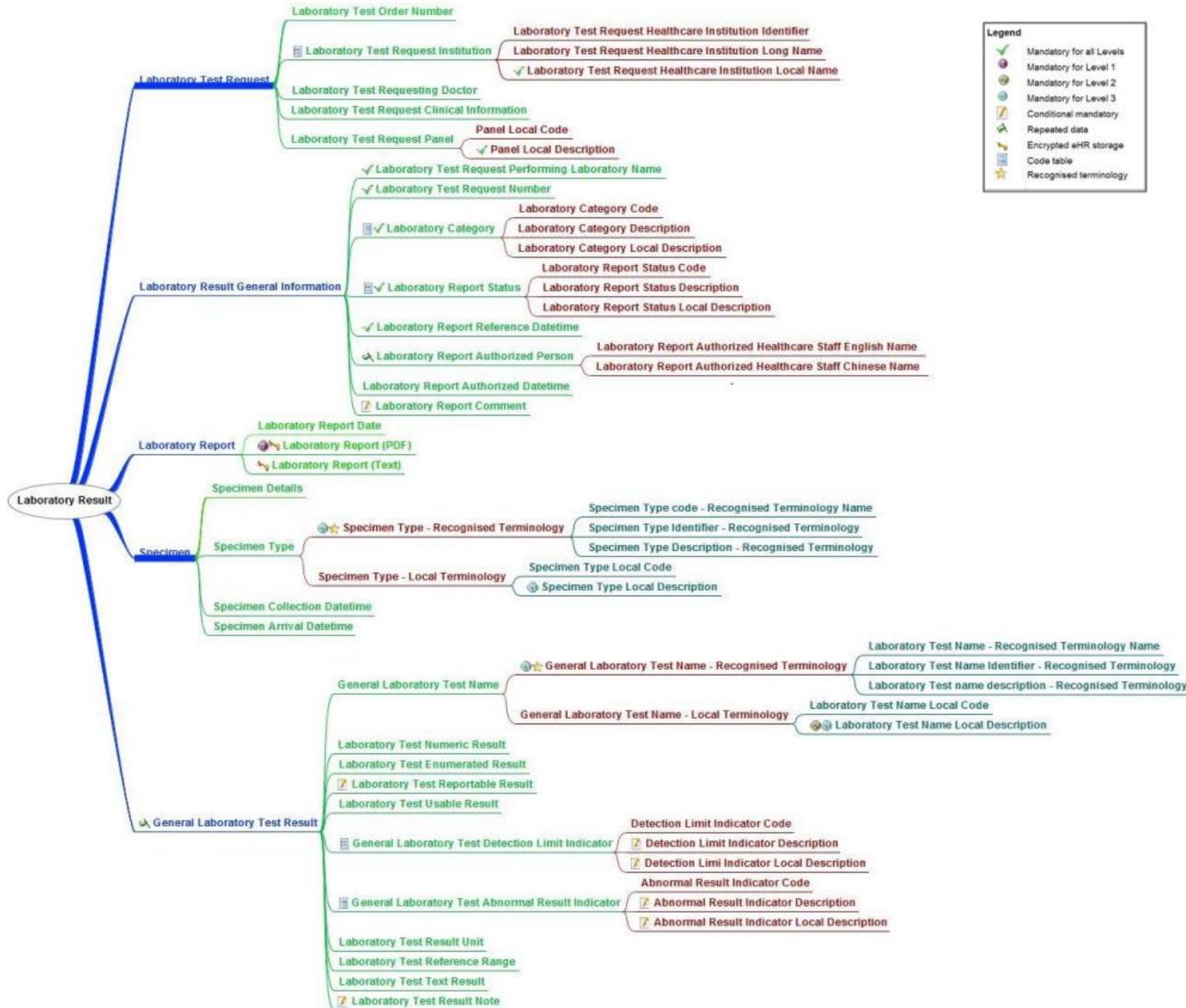
## eHealth Recognised Terminologies



Map to

Refer to

# LABGEN Dataset Mindmap



Legend

- ✓ Mandatory for all Levels
- Mandatory for Level 1
- Mandatory for Level 2
- Mandatory for Level 3
- Conditional mandatory
- △ Repeated data
- Encrypted eHR storage
- Code table
- ★ Recognised terminology

# LABGEN – Microbiology & Virology PDF Report Example



<b>ABC Laboratory</b>		Lab No: 24M5506874 Name: [REDACTED] HKID No: [REDACTED]	 Requester: Chan Tai Man Clinic Bed: _____ DOB: 30/01/1994
<b>Microbiology Laboratory</b>			
Clinical Details: Antenatal checkup/Antenatal checkup			
Date Collected: 29/11/2024 Date Arrived: 29/11/2024 Specimen:- Clotted Blood		Reference Interval -----	
HBsAg:	Non-reactive	N/A	
MICROBIOLOGY LABORATORY REPORT			
Authorized by: [REDACTED] 15:52 on 29/11/2024 Medical Microbiologist: [REDACTED]		This is the FINAL report. ***** End of report *****	

Mock up

# LABGEN – Level-1 PDF & Level-3 Standardized Data



<p><b>(Level 1)</b></p>  <p><b>PDF</b></p> <p><b>Laboratory Report Reference Date/time*</b></p>	<p><b>Laboratory Test Request Number*</b></p> <p><b>ABC Laboratory</b></p> <p><b>Laboratory Test Request Performing Laboratory Name*</b></p> <p><b>Clinical Details:</b> Antenatal checkup/Antenatal checkup</p> <p>Date Collected: 29/11/2024 Date Arrived: 29/11/2024 Specimen:- Clotted Blood</p> <p><b>HBsAg:</b> Non-reactive</p> <p><b>Reference Interval</b></p> <p><b>N/A</b></p> <p><b>Reference Range</b></p> <p><b>MICROBIOLOGY LABORATORY REPORT</b></p> <p><b>Laboratory Category*</b> C</p> <p><b>Laboratory Report Status*</b> C</p> <p><b>Mock up</b></p>
<p><b>(Level 3)</b></p> <p><b>RT Binding</b></p> <ul style="list-style-type: none"> <li>• RT Name*</li> <li>• RT Identifier*</li> <li>• RT Description*</li> <li>• Local Code</li> <li>• Local Description*</li> </ul>	<p><b>RT</b> <b>Laboratory Test Name*</b></p> <p><b>Laboratory Test Result*</b></p> <p><b>Authorized by:</b> [redacted] 15:52 on 29/11/2024 <b>Medical Microbiologist:</b> [redacted]</p> <p>***** End of report *****</p> <p>This is the FINAL report</p>

\* Mandatory

C eHR Codex Table

RT Recognised Terminology - LOINC

# LABGEN – Share PDF (Level 1)



## Example

### Laboratory test order

- Format for e-Referral consent:  
<Referring HCP ID>:<Referral document reference number>

8088450656:12345678900000000306

### Laboratory Test Request Number

24M5506874

### Laboratory Test Request Performing Laboratory Name

ABC Laboratory

### Laboratory Test Request Healthcare Institution Name

Chan Tai Man Clinic

### Panel Local Description

Hepatitis B Surface Antigen

### Laboratory Report Reference Date/time

29/11/2024

- Specimen collection / arrival / registration

### Laboratory Category



Microbiology & Virology

### Laboratory Report Status



Final Report

### Report Image



Mandatory

Optional

C eHRCodex Table

# LABGEN – Share PDF & Standardized Data (Level 3)



## Example

### Laboratory Test Name RT

RT Name

LOINC

RT Identifier

5195-3

RT Description

Hepatitis B virus surface Ag [Presence] in Serum

Local Description

HBsAg

### Laboratory Test Result

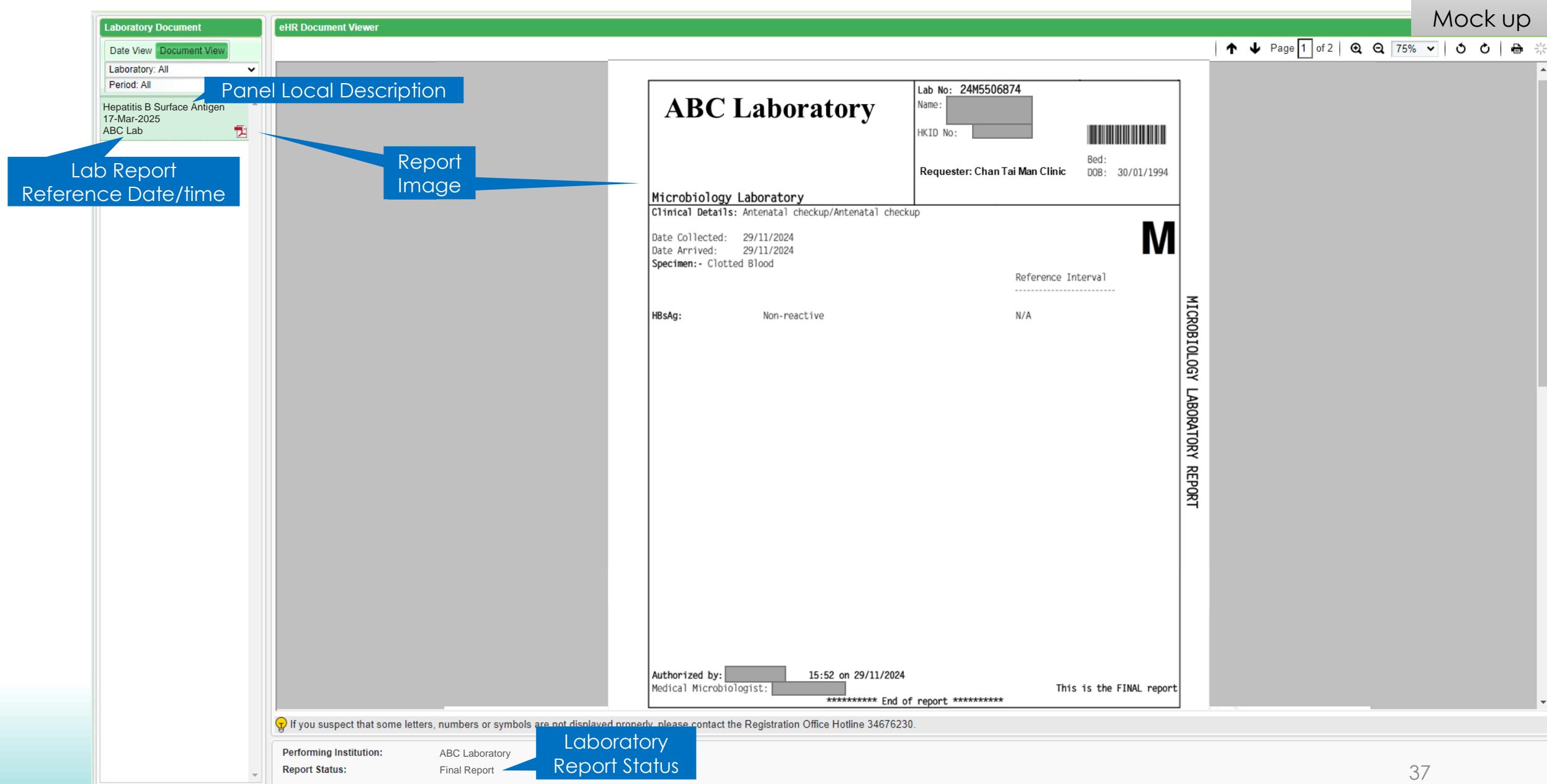
- Reportable/ Numeric/ Enumerated/ Text/ Usable

Non-reactive

### Reference Range

NA

# Lab Report Image in eHR Viewer



# Standardised Lab Data to Provide Cumulative View for Continuous Patient Care across different Healthcare Providers



**Mock up**

**Laboratory Record**

Date View Document View Last 2 years OR To Search Reset

Microbiology & Virology Longer time may be expected if the selected period is more than 2 years.

Date Profile Description Institution ABC Lab

29-Nov-2024 Hepatitis B Surface Antigen

Report Image Panel Local Description

**Laboratory Cumulative Result(s)**

Last 1 year

Institution	ABC Lab
Date	29-Nov-2024 15:52
PDF Report	
Hepatitis B virus surface Ag, Serum	Non-reactive

eHR Test Name (Standardised names for Level 3 data)

Feedback

**Interoperable Lab Data through Terminology Binding**

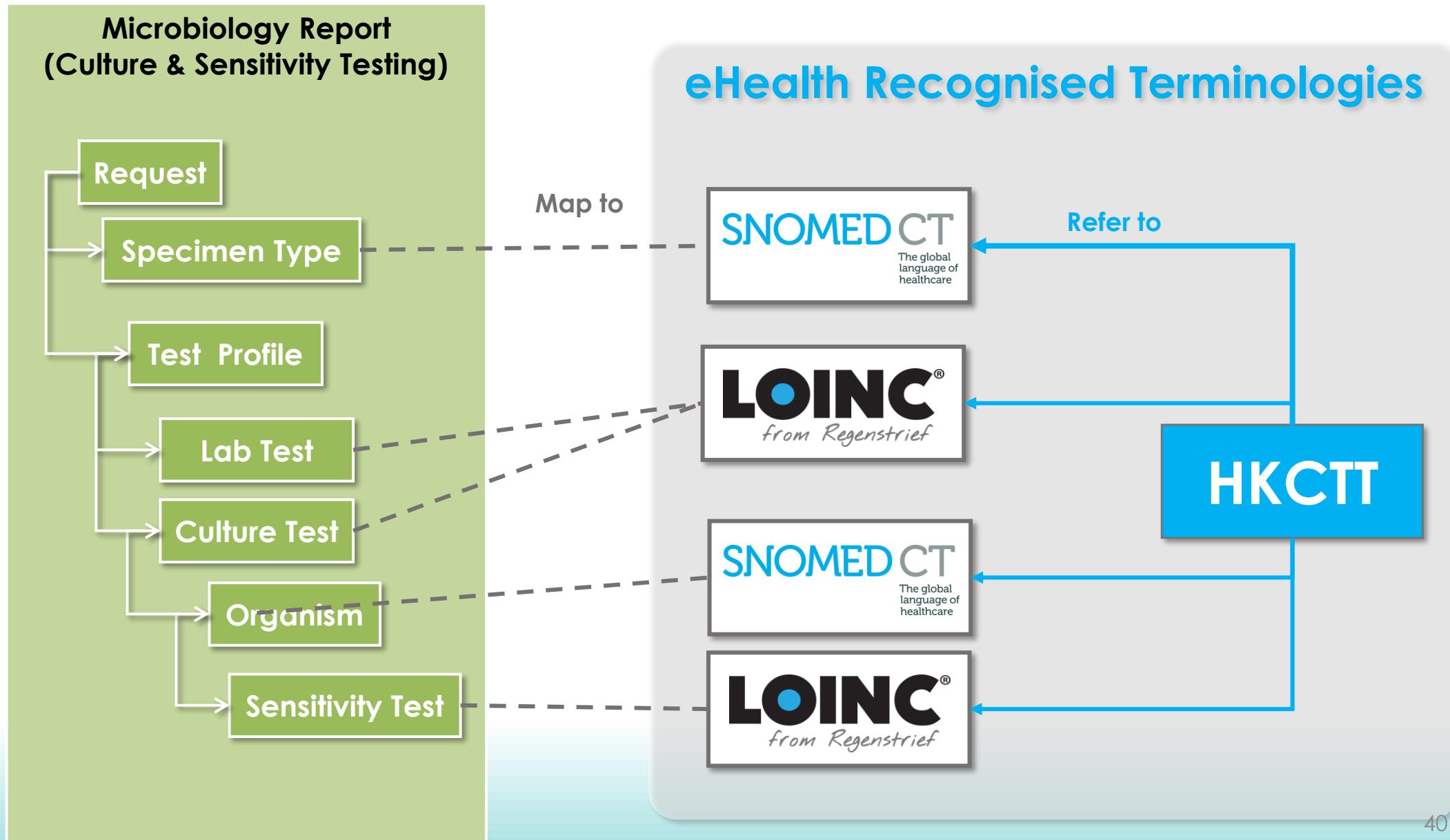


## **Microbiology (Culture & Sensitivity Test) Data Sharing**

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**LABMB Dataset Highlight**

# Microbiology (Culture & ST) Data Model & Terminology Binding



# LABMB Dataset Mindmap



## Legend

- ✓ Mandatory for all Levels
- Mandatory for Level 1
- Mandatory for Level 2
- Mandatory for Level 3
- ✎ Conditional mandatory
- ✖ Repeated data
- 🔒 Encrypted eHR storage
- Code table
- ★ Recognised terminology

# LABMB – Share PDF (Level 1)



Laboratory Test Request Performing Laboratory Name*	<u>ABC Laboratory</u>	Lab No: 20M7013801 Name: HKID No: Sex/Age: M/49Y Req. Loc.: XYZ Clinic Doctor: Dr. CHAN Tai Man	Laboratory Test Request Number*
C Laboratory Report Status*	Final Report	Laboratory Test Request Healthcare Institution Local Name*	
Panel Local Description*	<u>Microbiological Examination of Respiratory Specimens</u>		
Laboratory Report Reference Date/time*	Date Collected : 24/03/2022 Date Received : 24/03/2022	Specimen : Sputum	
<b>Respiratory Bacterial culture :</b>			
Organism 1 : Enterococcus faecium			
Antibiotics	ORGANISM 1		
Ampicillin	R	Report Image*	
Vancomycin (MIC)	R	PDF	
Organism 1 : Enterococcus faecium MIC of Vancomycin (MIC) : 32 ug/ml			

# LABMB – Share PDF (Level 1) & Standardized Data (Level 3)



Laboratory Test Request Performing Laboratory Name*	<u>ABC Laboratory</u>	Lab No: 20M7013801 Name: HKID No: Sex/Age: M/49Y Req. Loc.: XYZ Clinic Doctor: Dr. CHAN Tai Man	Laboratory Test Request Number*
C Laboratory Report Status*	Final Report	Laboratory Test Request Healthcare Institution Local Name*	
Panel Local Description*	<u>Microbiological Examination of Respiratory Specimens</u>		
Laboratory Report Reference Date/time*	Date Collected : 24/03/2022 Date Received : 24/03/2022		
RT Specimen type	Specimen : Sputum		
RT Microbiology culture test*	Respiratory Bacterial culture :		
RT Organism	Organism 1 : Enterococcus faecium		
RT Susceptibility test	Antibiotics	ORGANISM 1	Susceptibility test result C
	Ampicillin Vancomycin (MIC)	R R	Report Image*
RT Binding	Organism 1 : Enterococcus faecium MIC of Vancomycin (MIC) : 32 ug/ml		
• RT Name*			
• RT Identifier*			
• RT Description*			
• Local Code			
• Local Description*			

**PDF**

\* Mandatory

RT

Recognised Terminology – HKCTT , SNOMED CT, LOINC

C

eHR Codex Table

# LABMB – Share PDF (Level 1)



## Example

**Panel Local Description**

Microbiological Examination of  
Respiratory Specimens

**Specimen Type**

Sputum

**Laboratory Report Reference Date/time**

- Specimen collection / arrival / registration

24/03/2022 10:45

**Laboratory Category** 

Microbiology & Virology

**Laboratory Report Status** 

Final Report

**Report Image**



**LABMB – Share PDF & Standardized Data (Level 3)**



## Example

## Specimen type RT

RT Name HKCTT

RT Identifier 5700284

## RT Description Sputum

## **Local Description**

**Microbiology Culture Test Name /**  
**Laboratory Test Name** RT

## RT Name LOINC

RT Identifier 32355-0

## RT Description

## Bacteria identified in Specimen by Respiratory culture

**Local Description** Respiratory Bacterial culture :



RT

Recognised Terminology – HKCTT, SNOMED CT, LOINC

# LABMB – Share PDF & Standardized Data (Level 3)



## Example

Organism    RT

RT Name	HKCTT
RT Identifier	5000968
RT Description	Enterococcus faecium
Local Description	Enterococcus faecium

Susceptibility Test    RT

RT Name	LOINC
RT Identifier	18864-9
RT Description	Ampicillin [Susceptibility]
Local Description	Ampicillin

Susceptibility Test Result    C

R

# Microbiology Records in eHR Viewer



醫健通 eHealth 香港政府 HKSGOV

All Local Non-Local Help COVID-19 Related

Lab Report Reference Date/time

Laboratory Record

Chemical Pathology  
Haematology  
Immunology  
**Microbiology & Virology**  
Anatomical Pathology  
Toxicology  
Transplantation & Immunogenetics  
Molecular Pathology  
General & Other

Lab Category

eHR Test Name  
(Standardised names for Level 3 data)

Date View Document View Period: All OR To Search Reset

Microbiology & Virology

Longer time may be expected if the selected period is more than 2 years.

Date Profile Description Institution

03-Mar-2023	Mid-Stream Urine/Urine Culture	VUC4_A
03-Mar-2023	Mid-Stream Urine/Urine Culture	VUC4_A
03-Mar-2023	Mid-Stream Urine/Urine Culture	VUC4_A
24-Mar-2022	SPUTUM/Sputum Culture	VUC4_A
12-Mar-2022	Rectal Swab/CRE Screening	VUC4_A

Specimen Type/Panel Local Description

Laboratory Cumulative Result(s)

Last 1 year

Institution	VUC4_A
Date	24-Mar-2022 10:45
PDF Report	Report Image
Specimen Type	SPUTUM
Microscopy, Smear	Moderate numbers of WBC seen A few epithelial cell seen
Bacteria, Respiratory culture	Enterococcus faecium
Appearance, Sputum	Purulent Blood-stained

Feedback

# Microbiology Culture Results in eHR Viewer



醫健通 All Local Non-Local Laboratory Record

Laboratory Details

Attending Institution	XYZ CLINIC	Reference Date	24-Mar-2022 10:45
Requesting Institution	XYZ CLINIC	Collection Date	24-Mar-2022 10:45
Performing Institution	ABC LABORATORY		
Request Number	22B2162542		
Comment	There are no zone diameter breakpoints in the CLSI standard for cefoperazone/sulbactam tested, the result is for reference only.		
Specimen Type	SPUTUM		

Test Name	Content	Reference Range	Comment
Microscopy :	<p>Moderate numbers of WBC seen A few epithelial cell seen</p>		
Sputum culture :			
Organism 1: Enterococcus faecium	Heavy growth		
• Ampicillin	Resistant		
• Vancomycin	Sensitive		

**Close**

Feedback

Institution: VUC4\_A (repeated 5 times)

# Strategy for Laboratory Data Sharing



# Checklist - Lab Data Sharing to eHealth





# Terminology Mapping Strategy

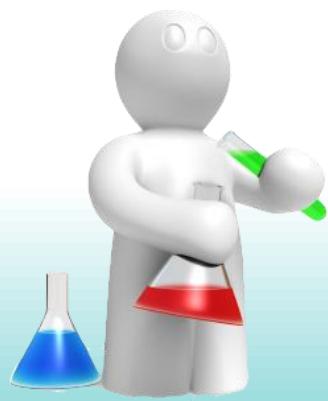
1. To identify structured data for mapping



2. To map the common large volume tests (80/20 rule)



3. To dedicate resources on terminology maintenance



Medical Lab Experts  
is the

Links to terminology eLearning:



# eHR Common 300 Laboratory Tests

80  
20



## eHR Common Laboratory Test List

389 laboratory LOINC terms are defined in eHR Common Laboratory Test List.

The list is based on the study of 16,658,509 laboratory test data which were shared by healthcare providers (HCPs) to eHR Sharing System in 2 weeks of year 2021.

Top 389 LOINC terms were ranked with 97.1% coverage of total HCPs shared laboratory test data volume.

The list is governed by eHR Information Standards Domain Group on Laboratory Records.

### LOINC Terms of Use

<http://loinc.org/terms-of-use>



eHR Common Laboratory Test List (as at Nov 2021)

Rank	LOINC	LOINC Description	eHR Description	eHR Laboratory Category
1	14682-9	Creatinine [Moles/volume] in Serum or Plasma	Creatinine, Serum or Plasma	Chemical Pathology
2	2951-2	Sodium [Moles/volume] in Serum or Plasma	Sodium, Serum or Plasma	Chemical Pathology
3	2823-3	Potassium [Moles/volume] in Serum or Plasma	Potassium, Serum or Plasma	Chemical Pathology
4	22664-7	Urea [Moles/volume] in Serum or Plasma	Urea, Serum or Plasma	Chemical Pathology
5	718-7	Hemoglobin [Mass/volume] in Blood	Haemoglobin, Blood	Haematology
6	30428-7	MCV [Entitic volume]	Erythrocyte mean corpuscular volume (MCV)	Haematology
7	28539-5	MCH [Entitic mass]	Erythrocyte mean corpuscular haemoglobin (MCH)	Haematology
8	26453-1	Erythrocytes [#/volume] in Blood	Erythrocytes, Blood	Haematology
9	26464-8	Leukocytes [#/volume] in Blood	Leukocytes, Blood	Haematology
10	20570-8	Hematocrit [Volume Fraction] of Blood	Hematocrit (HCT), Blood	Haematology
11	26515-7	Platelets [#/volume] in Blood	Platelets, Blood	Haematology
12	28540-3	MCHC [Mass/volume]	Erythrocyte mean corpuscular haemoglobin concentration (MCHC)	Haematology
13	1742-6	Alanine aminotransferase [Enzymatic activity/volume] in Serum or Plasma	Alanine aminotransferase, Serum or Plasma	Chemical Pathology
14	30385-9	Erythrocyte distribution width [Ratio]	Erythrocyte distribution width (RDW)	Haematology
15	1751-7	Albumin [Mass/volume] in Serum or Plasma	Albumin, Serum or Plasma	Chemical Pathology
16	6768-6	Alkaline phosphatase [Enzymatic activity/volume] in Serum or Plasma	Alkaline phosphatase, Serum or Plasma	Chemical Pathology
17	2885-2	Protein [Mass/volume] in Serum or Plasma	Protein, Serum or Plasma	Chemical Pathology
18	14631-6	Bilirubin.total [Moles/volume] in Serum or Plasma	Bilirubin, Serum or Plasma	Chemical Pathology
19	5909-7	Blood smear finding [Identifier] in Blood by Light microscopy	Smear finding, Blood, Microscopy	Haematology
20	10834-0	Globulin [Mass/volume] in Serum by calculation	Globulin, Serum, Calculated	Chemical Pathology
21	28542-9	Platelet mean volume [Entitic volume] in Blood	Platelet mean volume (MPV), Blood	Haematology
22	26474-7	Lymphocytes [#/volume] in Blood	Lymphocytes, Blood	Haematology
23	26484-6	Monocytes [#/volume] in Blood	Monocytes, Blood	Haematology
24	26499-4	Neutrophils [#/volume] in Blood	Neutrophils, Blood	Haematology
25	26449-9	Eosinophils [#/volume] in Blood	Eosinophils, Blood	Haematology
26	26444-0	Basophils [#/volume] in Blood	Basophils, Blood	Haematology

# How to map lab test to



LOINC code 14328-9 : **Leukocytes [Presence] in Sputum by Light microscopy**



## COMPONENT (ANALYTE)

*The substance or entity being measured or observed.*

e.g. Leukocytes



## PROPERTY

*The characteristic or attribute of the analyte.*

e.g. Presence



## TIME

*The interval of time over which an observation was made.*

e.g. Point in time



## SYSTEM (SPECIMEN)

*The specimen or thing upon which the observation was made.*

e.g. Sputum



## SCALE

*How the observation value is quantified or expressed: quantitative, ordinal, nominal.*

e.g. Ordinal



## METHOD

*OPTIONAL A high-level classification of how the observation was made. Only needed when the technique affects the clinical interpretation of the results.*

e.g. Light Microscopy

# Same Component, Different LOINC Concepts

.getComponentIcon()	getPropertyIcon()	getTimeIcon()	getSystemIcon()	getScaleIcon()	getMethodIcon()
Component (Analyte)	Property	Time	System (Specimen)	Scale	Method
Leukocytes	Presence	Point in time	Sputum	Ordinal	Light Microscopy
< 14328-9 > Leukocytes [Presence] in Sputum by Light microscopy					
Leukocytes	Number concentration	Point in time	Blood	Quantitative	
< 26464-8 > Leukocytes [#/volume] in Blood					
Leukocytes	Morphology	Point in time	Bone marrow	Nominal	
< 11157-5 > Leukocytes [Morphology] in Bone marrow					
Leukocytes	Number Area	Point in time	Urine sediment	Quantitative	HPF Microscopy
< 5821-4 > Leukocytes [#/area] in Urine sediment by Microscopy high power field					

# To Download HKCTT Lab Terms For Standardised Data Preparation

HKCTT

Clinical Administration Standards Download Information | UPPPDOCOR022 UPPPDOCOR022 [Logout](#)

eHR Recognised Terminologies  Click here for the latest [List of Third Party Terminologies](#)

HKCTT for CMS Adaptation				
Release Date	HKCTT Version	Engine Version	Remarks	Download
04-Oct-2023	2023.10.04_707 (1.0.78)	1.X		<a href="#">Download</a>
17-Jan-2014	2014.01.17_33 (0.0.1)	0.X	No further update of offline HKCTT data.	<a href="#">Download</a>

HKCTT				
Release Date	Version	Nature		Download
04-Oct-2023	2023.10.04_708	All natures		<a href="#">Download</a>
04-Oct-2023	2023.10.04_704	Diagnosis, Procedure		<a href="#">Download</a>
04-Oct-2023	2023.10.04_705	Laboratory Test, Organism, Specimen, Anatomical Pathology Terms		<a href="#">Download</a>
04-Oct-2023	2023.10.04_706	Pharmaceutical Product, Drug related Substances, Drug related Qualifier		<a href="#">Download</a>
21-Oct-2022	2022.10.21_678	Allergens		<a href="#">Download</a>
21-Oct-2022	2022.10.21_679	ADR Causative Agents		<a href="#">Download</a>
21-Oct-2022	2022.10.21_680	Vaccines		<a href="#">Download</a>
21-Oct-2022	2022.10.21_681	Prescribed Drugs		<a href="#">Download</a>
21-Oct-2022	2022.10.21_682	Dispensed Drugs		<a href="#">Download</a>
10-Feb-2022	2022.02.10_656	中醫病名, 中醫辨證, 中醫治法, 中醫療法		<a href="#">Download</a>
10-Feb-2022	2022.02.10_657	中藥產品		<a href="#">Download</a>

# Question & Answer



# Thank You



# eHR Data Compliance Testing



## **Step 1: Engage & Pre-assessment**

- Data field & codex mapping
- Terminology mapping

## **Step 2: Technical readiness**

- IT technical testing
- Business case testing

## **Step 3: Upload & Post-implementation Review**

# eHR Codex Table – Laboratory Category

## Laboratory category

Purpose: To indicate the performing laboratory category

Reference: Hospital Authority

Term ID	eHR Value	eHR Description	Definition
9050067	CHEM	Chemical Pathology	Chemical Pathology Laboratory
9050170	HAEM	Haematology	Haematology Laboratory
9050190	IMMUN	Immunology	Immunology Laboratory
9050266	MICRO	Microbiology & Virology	Microbiology and Virology Laboratory
9050013	PATH	Anatomical Pathology	Anatomical Pathology Laboratory
9050443	TRL	Toxicology	Toxicology Laboratory
9050446	TI	Transplantation & Immunogenetics	Transplantation and Immunogenetics Laboratory
9050272	MOLPATH	Molecular Pathology	Molecular Pathology Laboratory
9050147	GEOT	General & Other	General Laboratory and Other Laboratory



# eHR Codex Table – Laboratory Report Status

## Laboratory report status

Purpose: To indicate the laboratory report reporting status

Reference: Hospital Authority

Term ID	eHR Value	eHR Description	Definition
9050361	P	Provisional/Preliminary report	A provisional report is issued when provisional or partial results become available and report is submitted to eHR. A final report will always follow after the provisional report.
9050137	F	Final report	A completed report for the laboratory request.
9050010	A	Amended report	An Amended report is issued when the final report of diagnosis or test result(s) have been changed or amended. Amended report includes information with the latest submitted provisional report/final report/supplementary report.
9050427	S	Supplementary report	A supplementary report is issued when additional information is available when provisional/ final/ amended report has been submitted to eHR.
9050470	U	Unspecified report status	Laboratory report status cannot be provided.



# eHR Codex Table – Abnormal Result Indicator

## Abnormal result indicator

Purpose: To indicate the laboratory test numeric result that is above or below the reference range of the test

Reference: Hospital Authority

Term ID	eHR Value	eHR Description
9050244	L	Low
9050174	H	High



# eHR Codex Table – Susceptibility Test and Related Property Result

## Susceptibility test and related property result

Purpose: To indicate the result of antibiotic susceptibility test and related property of the isolated organism

Reference: Hospital Authority

Term ID	eHR Value	eHR Description
9050402	S	Sensitive
9050200	I	Intermediate
9050378	R	Resistant
9050353	P	Positive
9050285	N	Negative
9050193	U	Indeterminate
9050521	SDD	Susceptible Dose Dependent



# Dataset briefing for Radiology Examination Record

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By

Rex Yiu (Health Informatics Analyst I, Hospital Authority)

# Information Standards + Radiology Examination

醫健通  
eHealth

香港特別行政區政府 HKSARGOV

2025 | 03



# Aim

- To introduce the information standards of eHealth domain:
  - Radiology Examination

# Radiology Examination



- **Support data sharing at compliance levels 1, 2 & 3**
  - 'Radiology exam datetime' is mandatory in all levels
  - 'Radiology modality' is mandatory in all levels
- **Sub-classified according to 'Radiology modality', e.g.**
  - Plain x-ray, ultrasound, CT, MRI, ...
- **Include the following contents:**
  - Radiology Report (PDF) --- (with Radiology exam, via HL7 gateway)
  - Radiology Images --- (via DICOM gateway)

# Mindmap

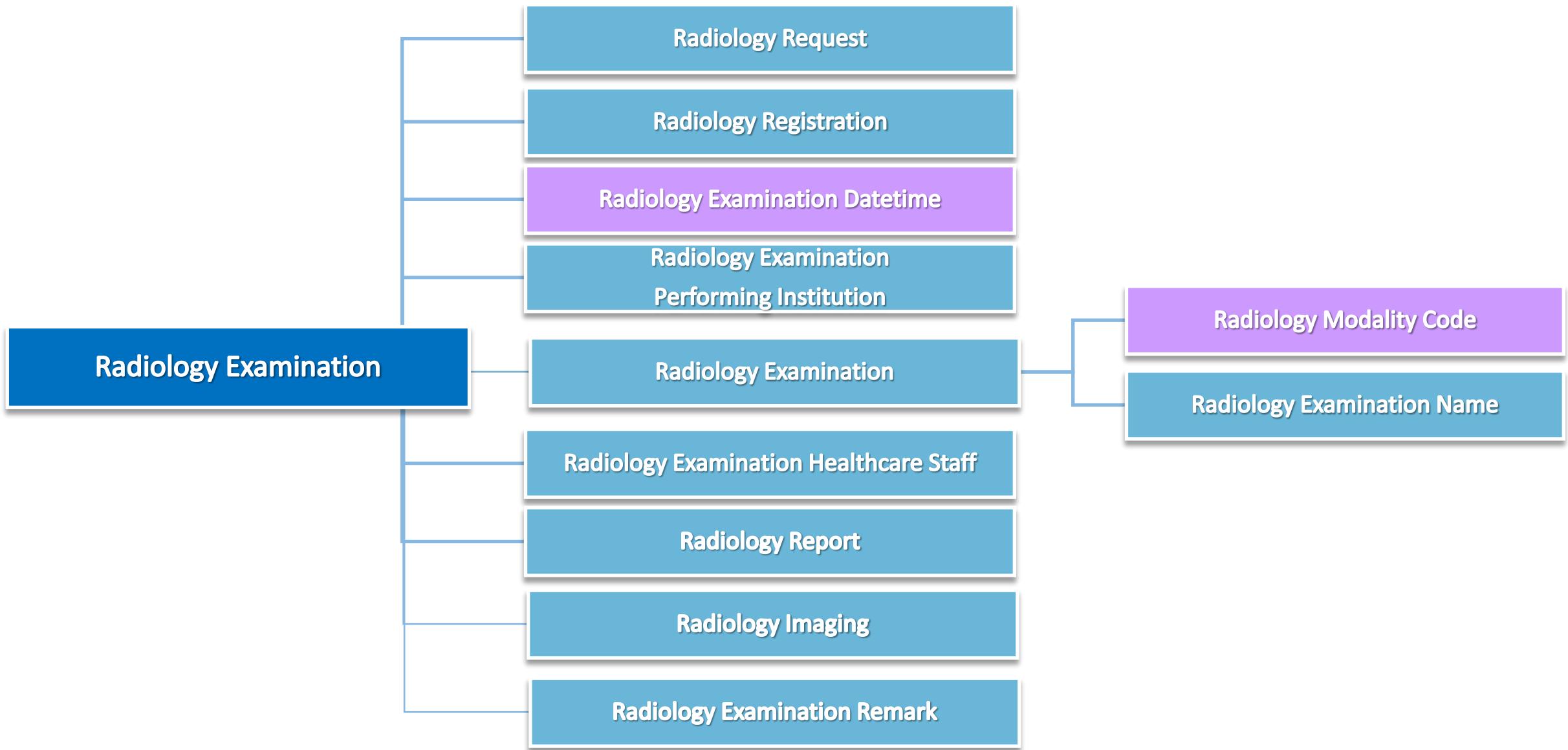
Set of 3 data



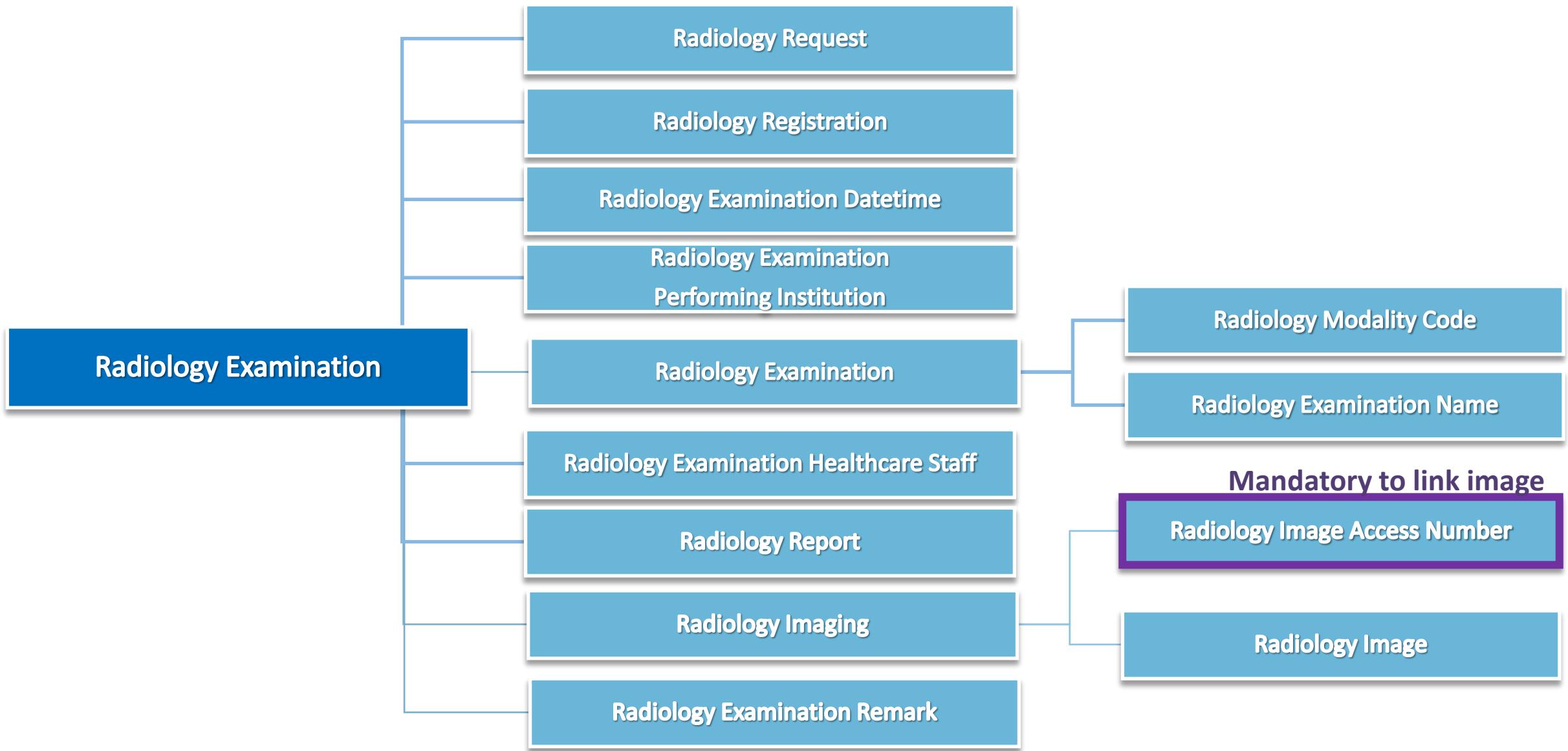
# Radiology Examination



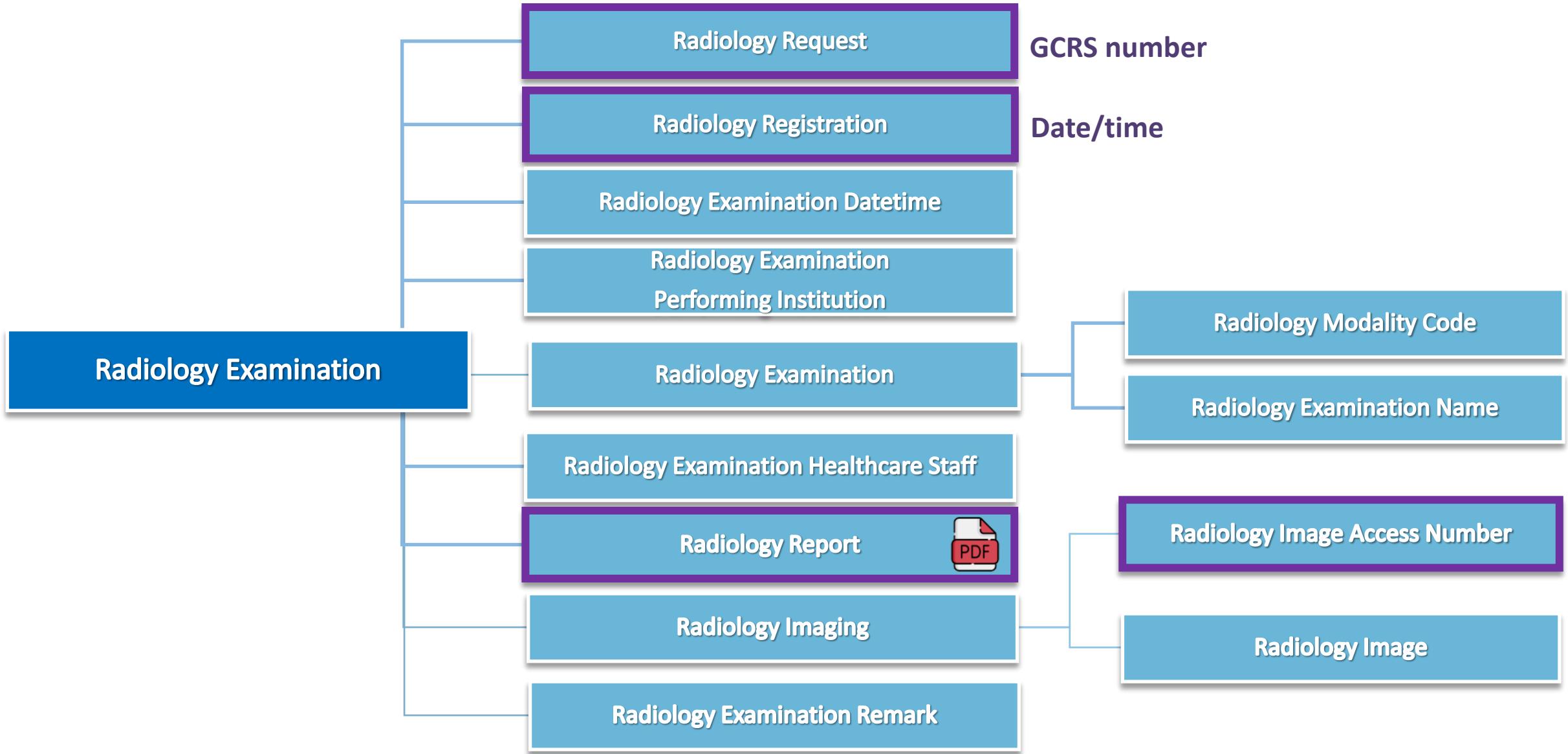
Mandatory



# Mandatory fields if image is uploaded

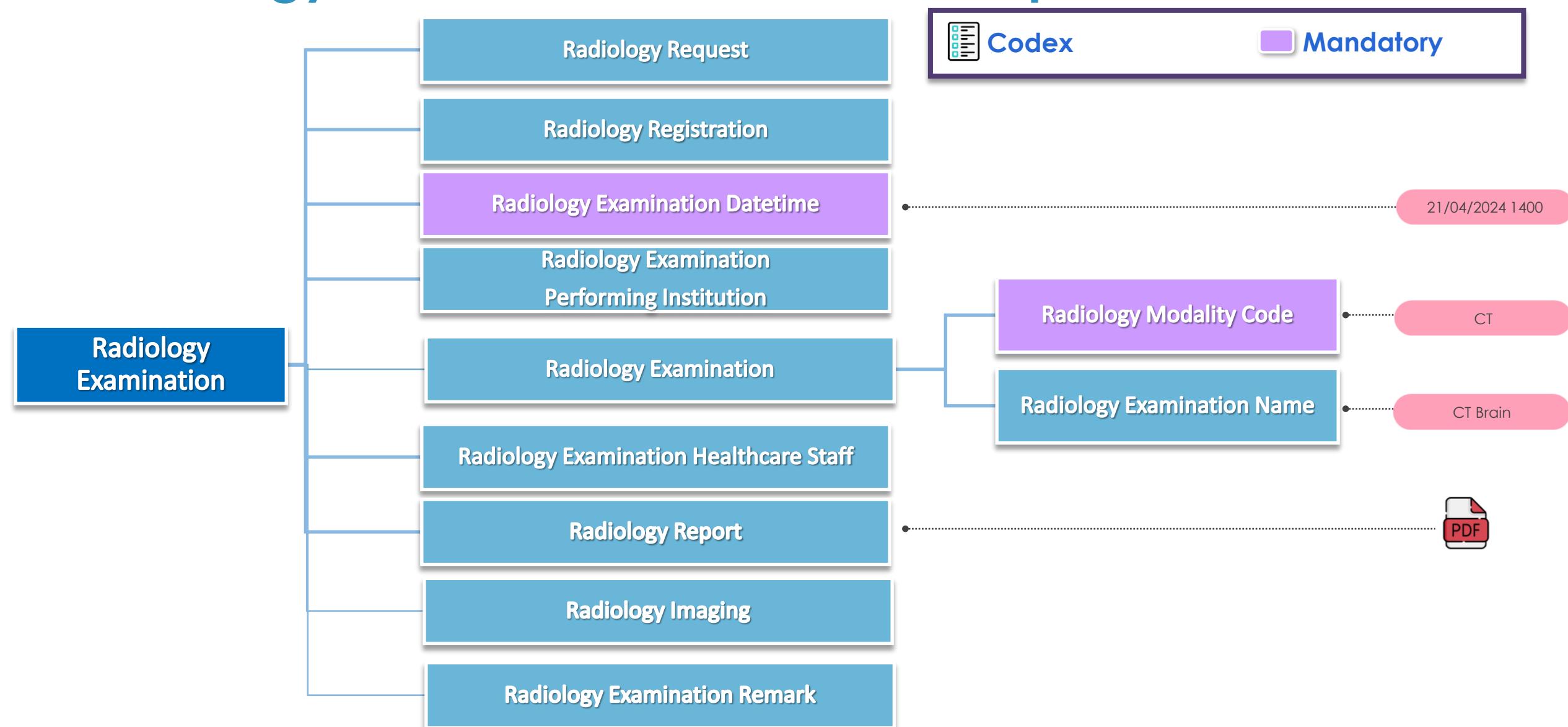


# Mandatory fields if image/report sent back to HA



# Radiology Examination: Level 1 Example

EXAMPLE



# Radiology Examination: Level 2 Example



Codex

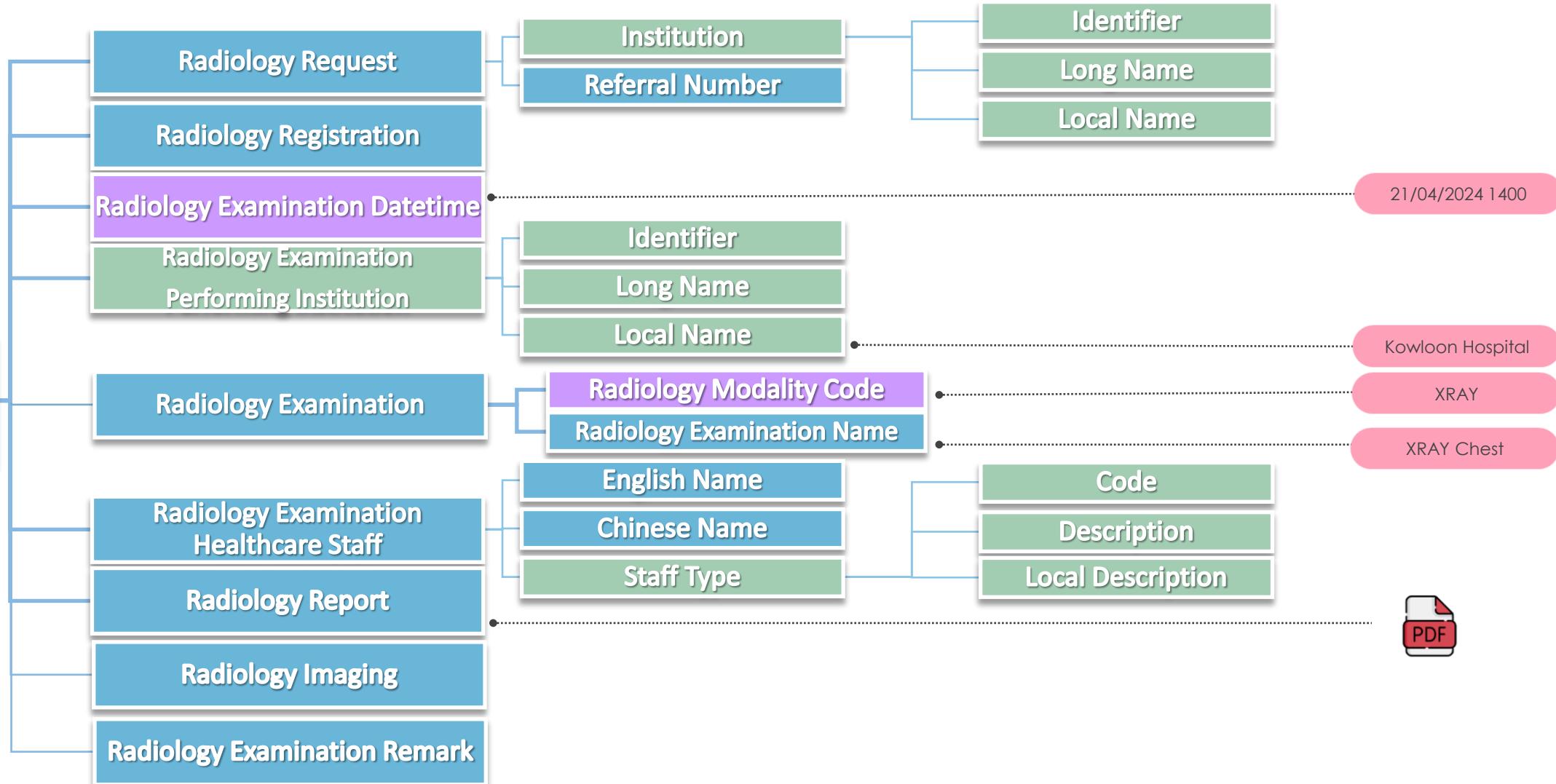


Mandatory



Sets of 3 data

EXAMPLE



# Radiology Examination: Level 3 Example



Codex

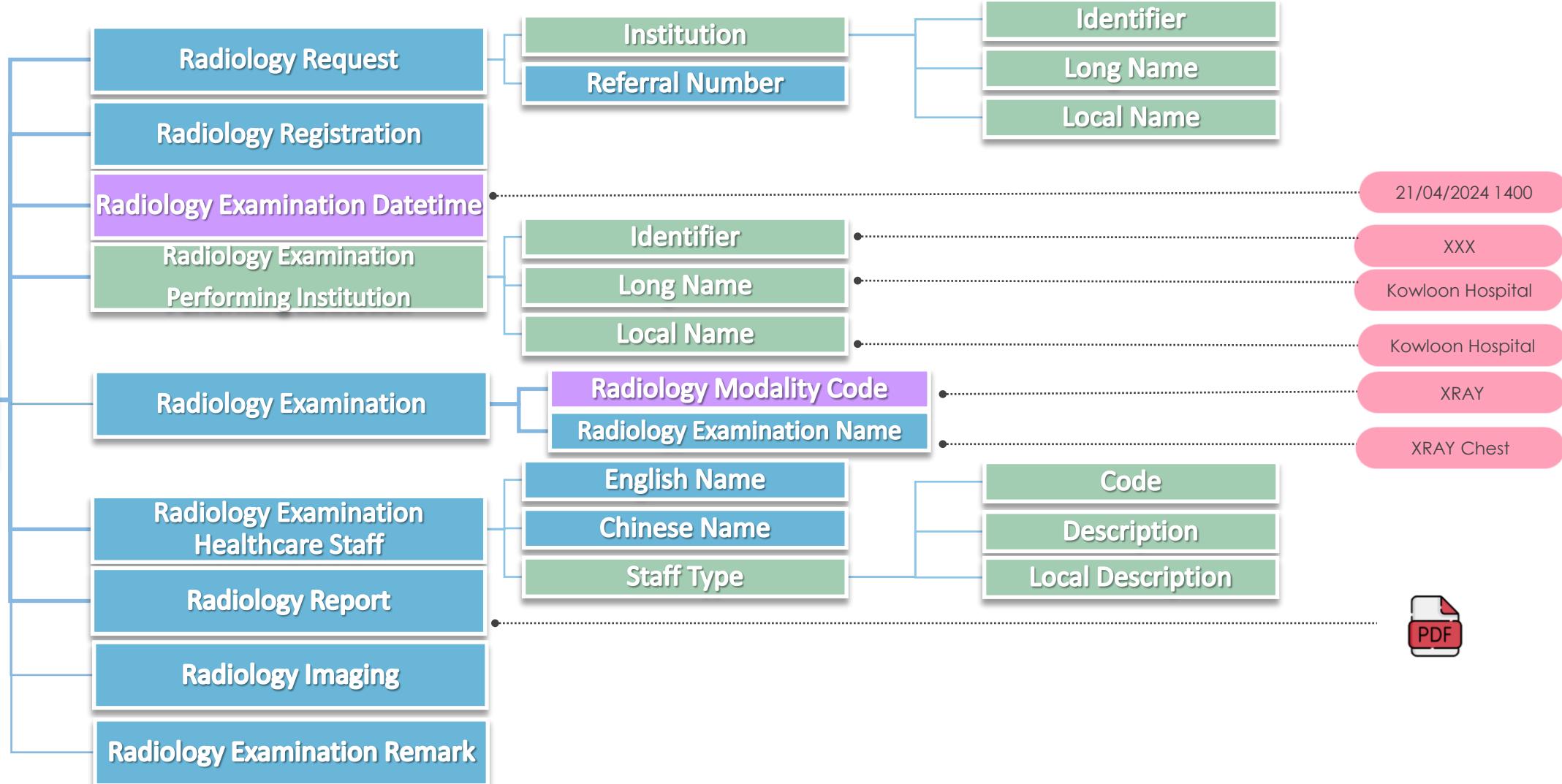


Mandatory



Sets of 3 data

EXAMPLE



# Codex - Radiology modality

- Purpose: to identify the modality of the radiology examination, the type of radiology examination so that the report can be filed in the e-HR automatically

Term ID	eHR Value	eHR Description	Full Description	eHR Description (Chinese)
9050149	XRAY	General radiology	General radiology	一般放射檢查
9050139	FLUOR	Fluoroscopy	Fluoroscopy	透視檢查
9050460	US	Ultrasonography	Ultrasonography	超聲造影
9050087	CT	Computed tomography	Computed tomography	電腦掃描造影
9050049	BI	Breast imaging	Breast imaging	乳腺造影
9050015	ANGIO	Angiographic / vascular IR	Angiographic examination / vascular interventional radiology	血管造影及介入治療
9050300	IR	Non-vascular IR	Non-vascular interventional radiology	非血管介入造影及治療
9050249	MRI	Magnetic resonance imaging	Magnetic resonance imaging	磁力共振掃描造影
9050305	NM	Nuclear medicine	Nuclear medicine	核子醫學
9050343	PET/CT	PET / CT fusion imaging	Positron emission tomography / computed tomography fusion imaging	正電子電腦斷層掃描造影
9050344	PET/MR	PET / MR fusion imaging	Positron emission tomography / magnetic resonance fusion imaging	正電子磁力共振掃描造影
9050320	OTHER	Other radiology modality	Other radiology modality	其他放射檢查

# Codex - Procedure healthcare staff type

- Purpose: to indicate the healthcare staff who chiefly responsible for performing the procedure

Term ID	eHR Value	eHR Description
9050068	C	Chief healthcare staff of the procedure
9050023	A	Assistant healthcare staff of the procedure

# Note 1: Records with image



- If the Radiology Image is being uploaded as well, the following data are **mandatory**:
  - **Radiology Image Accession Number**
    - Mandatory (Insert/Update/Delete)
    - **For Linking with Image**
    - Conform to standard format
      - Convention: <hosp\_cd> <dept\_cd> <running\_number> <check digit>
      - Assigned hospital code and department code
      - Check digit calculated by assigned shift factor
    - Uniqueness within institution

## Note 2: Records reporting back to HA



- If the Radiology Image/Report are being sent back to Hospital Authority, the following data are **mandatory**:
  - **Radiology Referring Number**
    - Convention: < HA HCP ID > : < HA GCRS number >
    - HA GCRS number as printed on the HA GCRS request form
  - **Radiology Registration Date/time**
  - **Radiology Image Accession Number**
  - **Radiology Report (PDF)**

## Note 3: Records display in EVE

- Some data fields not mandatory, display in EVE
  - Data not provided, will have implication (blank) in EVE display
- Recommend to provide following data although these data fields not mandatory
  - **Radiology Examination Performing Institution**
  - **Radiology Examination Name**

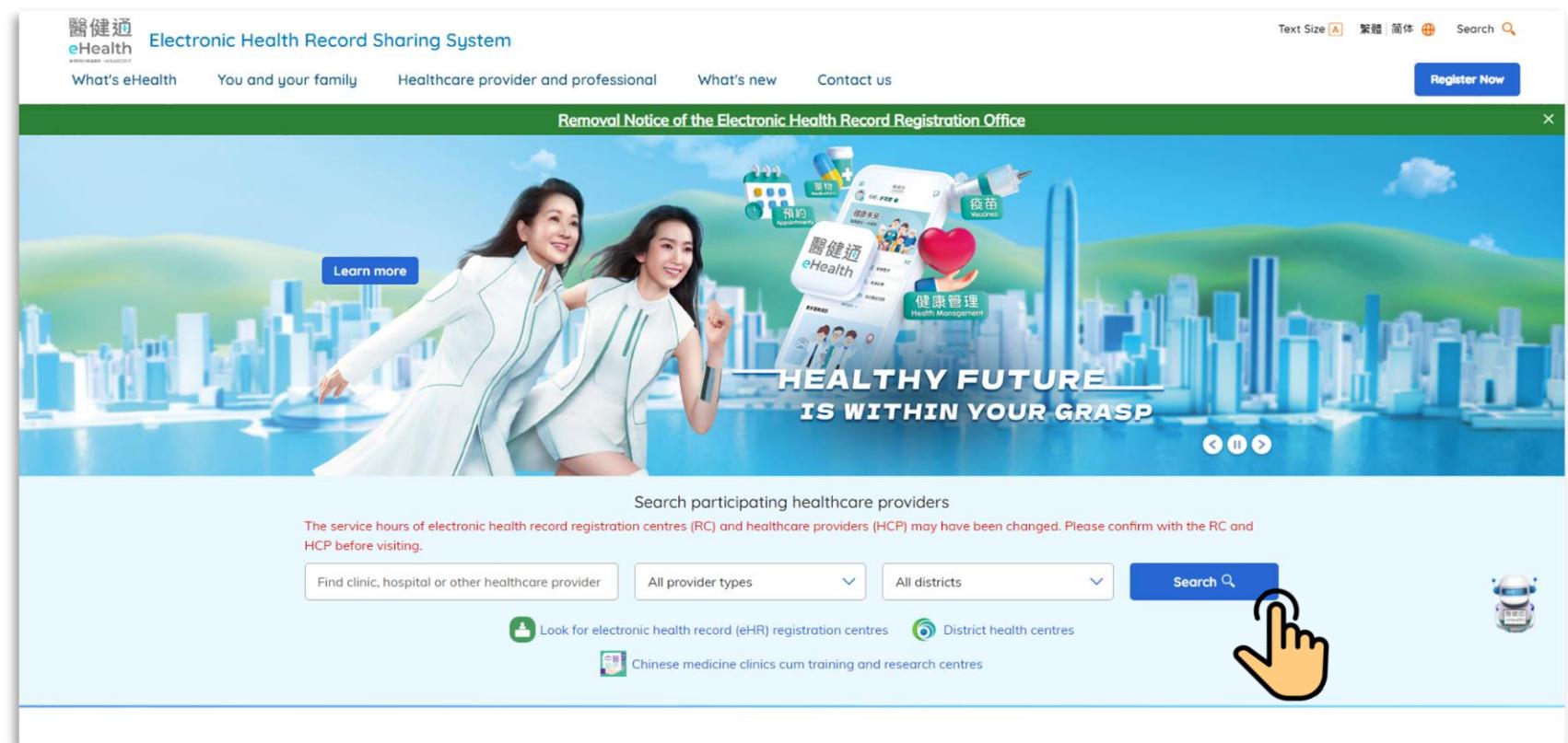


## Related File

- Data scheme & codex
  - Available in eHealth.gov.hk

# Registered Healthcare Providers

- <https://www.ehealth.gov.hk/>





醫健通  
eHealth

香港特別行政區政府 HKSARGOV

*Thank you*



Form	Category 1	Category 2	Entity Name	Entity ID	Definition	Data Type (code)	Data Type (description)	Validation Rule	Repeated Data	Code Table	Remark	Data Type in IAMS	Data requirement (Certified Level 1)	Data requirement (Certified Level 2)	Data requirement (Certified Level 3)	Example (Certified Level 1)	Example (Certified Level 2)	Example (Certified Level 3)	
Radiology Examination	Radiology Request	Radiology Request Healthcare Institution	Radiology request healthcare institution identifier	1003483	The healthcare institution where the radiology request was created. It is the [HCI identifier] in the eHR Healthcare Provider Index.	CE	Coded element				Refer to Provider Registry	CE	NA	NA	O		KH		
Radiology Examination	Radiology Request	Radiology Request Healthcare Institution	Radiology request healthcare institution long name	1003484	The healthcare institution where the radiology request was created. It is the [HCI displayed English long name] or the [HCI displayed Chinese long name] in the eHR Healthcare provider index. It should be the corresponding description of the selected [HCI identifier].	ST	String				Refer to Provider Registry	CE	NA	NA	M if [Radiology request institution identifier] is given NA if [Radiology request institution identifier] is blank		Kowloon Hospital		
Radiology Examination	Radiology Request	Radiology Request Healthcare Institution	Radiology request healthcare institution local name	1003485	Local description of the healthcare institution where the radiology request was created	ST	String					ST	NA	O	M if [Radiology request institution identifier] is given O if [Radiology request institution identifier] is blank	Dr. Chan Clinic	Kowloon Hospital		
Radiology Examination	Radiology Request		Referral number	1003486	A unique identifier issued by the healthcare institution who referred the healthcare recipient to the performing / visited institution. This number will be served as a part of the referral number for eReferral.	ST	String					ST	O	O	O	20150001	20151234	123995	
Radiology Examination	Radiology Registration		Radiology registration datetime	1007089	Date / time when the healthcare recipient was registered at the Radiology Department before the radiology examination. If the radiology record would be sent to the Hospital Authority (HA) via eHRS5, this date/time must be provided.	TS	Time stamp					TS	O	O	O	31/1/2010 16:30	20/4/2015 09:08	07/10/2012 14:25	
Radiology Examination	Radiology Registration		Radiology registration number	1004990	A unique identifier assigned by the Radiology Information System (RIS) of the performing institution to identify the radiology examination referred/referred.	ST	String					ST	O	O	O	258256	77778	521000	
Radiology Examination			Radiology examination datetime	1003487	Date / time when the radiology examination was performed. If the radiology procedure examination date / time is not available, can use the report creation date; if report creation date is not available, can use the submission date to eHR.	TS	Time stamp					TS	M	M	M	21/12/2010	06/12/2012	06/01/2010	
Radiology Examination	Radiology Examination	Radiology modality code	1003488	[eHR value] of the "Radiology modality" code table, to define modality of the radiology examination	CE	Coded element	R	Radiology modality					S	M	M	M	CT	MR	MR
Radiology Examination	Radiology Examination	Radiology examination name	1003489	The name of the radiology examination such as the examination region(s) or site(s)	ST	String	R					ST	O	O	O	brain	Head and neck	Abdomen and pelvic	
Radiology Examination	Radiology Examination Performing Institution		Radiology examination performing institution identifier	1003490	The healthcare institution where the radiology examination was performed. It is the [HCI identifier] in the eHR Healthcare Provider Index.	CE	Coded element				Refer to Provider Registry	CE	NA	NA	O		KH		
Radiology Examination	Radiology Examination Performing Institution		Radiology examination performing institution long name	1003491	The healthcare institution where the radiology examination was performed. It is the [HCI displayed English long name] or the [HCI displayed Chinese long name] in the eHR Healthcare Provider Index. It should be the corresponding description of the selected [HCI identifier].	ST	String				Refer to Provider Registry	CE	NA	NA	M if [radiology examination performing institution identifier] is given NA if [radiology performing institution identifier] is blank		Kowloon Hospital		
Radiology Examination	Radiology Examination Performing Institution		Radiology examination performing institution local name	1003492	Local description of the healthcare institution where the radiology examination is performed.	ST	String					ST	O	O	O		Dr. Chan Clinic	Kowloon Hospital	
Radiology Examination	Radiology Examination Healthcare Staff	Radiology examination healthcare staff English name	1003493	Full English name (with title, where applicable) of the healthcare staff who performed the radiology examination	ST	String	R					ST	NA	O	O		Dr. Chan Tai Man	Dr. Chan Tai Man	
Radiology Examination	Radiology Examination Healthcare Staff	Radiology examination healthcare staff Chinese name	1003494	Full Chinese name (with title, where applicable) of the healthcare staff who performed the radiology examination	ST	String	R					ST	NA	O	O		陳大文	陳大文	
Radiology Examination	Radiology Examination Healthcare Staff part	Radiology examination healthcare staff type code	1003495	[eHR description] of the "Procedure healthcare staff type" code table which is used to identify the healthcare staff who is mainly responsible for the radiology examination. It should be the corresponding description of the selected [radiology examination healthcare staff type code].	ST	String	R	Procedure healthcare staff type					ST	NA	NA	M if [radiology examination healthcare staff type code] is given NA if [radiology examination healthcare staff type code] is blank		Chief procedure healthcare staff	
Radiology Examination	Radiology Examination Healthcare Staff	Radiology examination healthcare staff type	1003496	[eHR description] of the "Procedure healthcare staff type" code table which is used to identify the healthcare staff who is mainly responsible for the radiology examination. It should be the corresponding description of the selected [radiology examination healthcare staff type code].	ST	String	R	Procedure healthcare staff type					ST	NA	NA	M if [radiology examination healthcare staff type code] is given NA if [radiology examination healthcare staff type code] is blank		Chief in-charge	
Radiology Examination	Radiology Examination Healthcare Staff	Radiology examination healthcare staff type local description	1003497	Local description of the type of the healthcare staff who performed the radiology examination	ST	String	R					ST	NA	O	O				
Radiology Examination	Radiology Report	Radiology report title	1003498	The title of the radiology report	ST	String						ST	O	O	O	CT brain report	MR on Head and Neck report	MR on abdomen and pelvic report	
Radiology Examination	Radiology Report	Radiology report date	1003499	The documentation date of the radiology report, first use the last endorsed date; if not available, use first endorsed date; if not available, use radiology examination date.	TS	Time stamp						TS	O	O	O	16/12/2010	09/12/2010	31/01/2010	
Radiology Examination	Radiology Report	Radiology report - reported by	1003500	Full English name (with title, where applicable) of the healthcare staff who reported the radiology examination information	ST	String						ST	NA	O	O		Dr. Chan Tai Man	Dr. Chan Tai Man	
Radiology Examination	Radiology Report	Radiology Report - Reported by	1003501	Full Chinese name (with title, where applicable) of the healthcare staff who reported the radiology examination information.	ST	String						ST	NA	O	O		陳大文教授	陳大文教授	
Radiology Examination	Radiology Report	Radiology report (PDF)	1003502	Report of the radiology examination in Portable Document Format (PDF)	ED	Encapsulated data						ED	O	O	O				
Radiology Examination	Radiology Report	Radiology report (Text)	1003503	Report of the radiology examination in text format.	TX	Text						TX	O	O	O				

# Data schema: Radiology Examination

# Level 1 Example

→ Mandatory



Entity Name	Code Table	Data requirement (Certified Level 1)	Example (Certified Level 1)
Radiology request healthcare institution identifier		NA	
Radiology request healthcare institution long name		NA	
Radiology request healthcare institution local name		NA	
Referral number		O	20150001
Radiology registration datetime		O	31/1/2010 16:30
Radiology registration number		O	256256
Radiology examination datetime		M	21/12/2010
Radiology modality code	Radiology modality	M	CT
Radiology examination name		O	brain
Radiology examination performing institution identifier		NA	
Radiology examination performing institution long name		NA	
Radiology examination performing institution local name		NA	
Radiology examination healthcare staff English name		NA	
Radiology examination healthcare staff Chinese name		NA	
Radiology examination healthcare staff type code	Procedure healthcare staff type	NA	
Radiology examination healthcare staff type description	Procedure healthcare staff type	NA	
Radiology examination healthcare staff type local description		NA	
Radiology report title		O	CT brain report
Radiology report date		O	18/12/2010
Radiology report - reported by healthcare staff English name		NA	
Radiology report - reported by healthcare staff Chinese name		NA	
Radiology report (PDF)		O	
Radiology report (Text)		O	
DICOM image accession number		M if [Radiology image] is given	A1223456789012345
Radiology examination remark		O	abc

# Level 2 Example

→ Mandatory



Entity Name	Code Table	Data requirement (Certified Level 2)	Example (Certified Level 2)
Radiology request healthcare institution identifier		NA	
Radiology request healthcare institution long name		NA	
Radiology request healthcare institution local name		O	Dr. Chan Clinic
Referral number		O	20151234
Radiology registration datetime		O	20/4/2015 09:08
Radiology registration number		O	77778
Radiology examination datetime		M	06/12/2012
Radiology modality code	Radiology modality	M	MRI
Radiology examination name		O	Head and neck
Radiology examination performing institution identifier		NA	
Radiology examination performing institution long name		NA	
Radiology examination performing institution local name		O	Dr. Chan Clinic
Radiology examination healthcare staff English name		O	Dr. Chan Tai Man
Radiology examination healthcare staff Chinese name		O	陳大文教授
Radiology examination healthcare staff type code	Procedure healthcare staff type	NA	
Radiology examination healthcare staff type description	Procedure healthcare staff type	NA	
Radiology examination healthcare staff type local description		O	Supervisor
Radiology report title		O	MRI on Head and Neck report
Radiology report date		O	09/12/2010
Radiology report - reported by healthcare staff English name		O	Dr. Chan Tai Man
Radiology report - reported by healthcare staff Chinese name		O	陳大文教授
Radiology report (PDF)		O	
Radiology report (Text)		O	
DICOM image accession number		M if [Radiology image] is given	A1223456789012345
Radiology examination remark		O	abc

# Level 3 Example (1)

- Set of 3 data
- To provide either one
- Mandatory

→ Entity Name → Code Table → Data requirement (Certified Level 3) → Example (Certified Level 3)

Entity Name	Code Table	Data requirement (Certified Level 3)	Example (Certified Level 3)
Radiology request healthcare institution identifier		O	KH
Radiology request healthcare institution long name		M if [Radiology request institution identifier] is given NA if [Radiology request institution identifier] is blank	Kowloon Hospital
Radiology request healthcare institution local name		M if [Radiology request institution identifier] is given O if [Radiology request institution identifier] is blank	Kowloon Hospital
Referral number		O	123665
Radiology registration datetime		O	07/10/2012 14:25
Radiology registration number		O	521000
Radiology examination datetime		M	06/01/2010
Radiology modality code	Radiology modality	M	MRI
Radiology examination name		O	Abdomen and pelvic
Radiology examination performing institution identifier		O	KH
Radiology examination performing institution long name		M if [Radiology performing institution identifier] is given NA if [Radiology performing institution identifier] is blank	Kowloon Hospital
Radiology examination performing institution local name		M if [Radiology performing institution identifier] is given O if [Radiology performing institution identifier] is blank	Kowloon Hospital

## Level 3 Example (2)

- Set of 3 data
- To provide either one
- Mandatory



Entity Name	Code Table	Data requirement (Certified Level 3)	Example (Certified Level 3)
Radiology examination healthcare staff English name		O	Dr. Chan Tai Man
Radiology examination healthcare staff Chinese name		O	陳大文教授
Radiology examination healthcare staff type code	Procedure healthcare staff type	O	C
Radiology examination healthcare staff type description	Procedure healthcare staff type	M if [radiology examination healthcare staff type code] is given NA if [radiology examination healthcare staff type code] is blank	Chief procedure healthcare staff
Radiology examination healthcare staff type local description		M if [radiology examination healthcare staff type code] is given NA if [radiology examination healthcare staff type code] is blank	Chief in-charge
Radiology report title		O	MRI on abdomen and pelvic report
Radiology report date		O	31/01/2010
Radiology report - reported by healthcare staff English name		O	Dr. Chan Tai Man
Radiology report - reported by healthcare staff Chinese name		O	陳大文教授
Radiology report (PDF)		O	
Radiology report (Text)		O	
DICOM image accession number		M if [Radiology image] is given	A1223456789012345
Radiology examination remark		O	abc

# FHIR mapping for Laboratory Record (Microbiology) & Radiology Examination Record

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HL7 HONG KONG – 6<sup>TH</sup> CONNECTATHON

Mar 24, 2025

# What is “Connectathon”?

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Connectathon has two very important purposes and one very important principle. A Connectathon is an event that is centered on an open consensus built Interoperability (Connection) specification. The purpose of a Connectathon is both to prove that the specification is complete as well as to prove that implementations written to that specification can ‘connect’. The most important principle of a Connectathon is that it is a safe place for failure in these endeavors. That is that it is free of negative consequences of a mistake in someone’s implementation and that the specification might need to be refined.

Source: <https://healthcaresecprivacy.blogspot.com/2013/11/what-is-connectathon.html>

# Our Purpose

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## EHR

- Consent HL7 interface specification for HK eHealth
- Speed up private data sharing

## HL7 HK

- Form a community on HL7 & FHIR in HK to develop healthcare interface standards

# Topic

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## ◆ Resources

- DiagnosticsReport
- ServiceRequest
- ImageStudy
- Specimen
- Observation\*\*\*

## ◆ Challenge

# eHR Level of Compliance

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HK eHR	HL7	Data field	Field Content	
			Value	PDF
1	1	institutional (free text) description	institutional (free text) description	Y
2	2	<ul style="list-style-type: none"> <li>• institution-defined code</li> <li>• institutional description</li> </ul>	institutional description +/- institution-defined code	Y
3.1	3	<ul style="list-style-type: none"> <li>• institution-defined code</li> <li>• institutional description</li> <li>• international code (HK)</li> </ul>	<ul style="list-style-type: none"> <li>• institution-defined code</li> <li>• institutional description</li> <li>• international code (HK)</li> </ul>	Y
3.2	3	<ul style="list-style-type: none"> <li>• institution-defined code</li> <li>• institutional description</li> <li>• international code (HK)</li> <li>• fully specified</li> </ul>	<ul style="list-style-type: none"> <li>• institution-defined code</li> <li>• institutional description</li> <li>• international code (HK)</li> </ul>	Y

Free text / PDF report only

Structural data (local code)

Structural data  
(follow and included  
“recognized terminology”)

# eHR domain level

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Data Domain	Level 1	Level 2	Level 3
PMI, Encounter			
Allergy / ADR			
Immunisation			
Medication (Prescription / Dispensing)			
Problem			
Procedure			
Clinical Note / Summary, Investigation report, Referral			
Medical Certificate			
Laboratory (General, Microbiology, Pathology)			
Radiology			

# FHIR Resources

Categorized	Alphabetical	R2 Layout	By Maturity	Security Category	By Standards Status	By Committee
<b>Foundation</b>	<b>Conformance</b> <ul style="list-style-type: none"> <li>CapabilityStatement <a href="#">N</a></li> <li>StructureDefinition <a href="#">N</a></li> <li>ImplementationGuide 1</li> <li>SearchParameter 3</li> <li>MessageDefinition 1</li> <li>OperationDefinition <a href="#">N</a></li> <li>CompartmentDefinition 1</li> <li>StructureMap 2</li> <li>GraphDefinition 1</li> <li>ExampleScenario 0</li> </ul> <b>Terminology</b> <ul style="list-style-type: none"> <li>CodeSystem <a href="#">N</a></li> <li>ValueSet <a href="#">N</a></li> <li>ConceptMap 3</li> <li>NamingSystem 2</li> <li>TerminologyCapabilities 0</li> </ul> <b>Security</b> <ul style="list-style-type: none"> <li>Provenance 3</li> <li>AuditEvent 3</li> <li>Consent 2</li> </ul> <b>Documents</b> <ul style="list-style-type: none"> <li>Composition 2</li> <li>DocumentManifest 2</li> <li>DocumentReference 3</li> <li>CatalogEntry 0</li> </ul> <b>Other</b> <ul style="list-style-type: none"> <li>Basic 1</li> <li>Binary <a href="#">N</a></li> <li>Bundle <a href="#">N</a></li> <li>Linkage 0</li> <li>MessageHeader 4</li> <li>OperationOutcome <a href="#">N</a></li> <li>Parameters <a href="#">N</a></li> <li>Subscription 3</li> <li>SubscriptionStatus 0</li> <li>SubscriptionTopic 0</li> </ul>					
<b>Base</b>	<b>Individuals</b> <ul style="list-style-type: none"> <li>Patient <a href="#">N</a></li> <li>Practitioner 3</li> <li>PractitionerRole 2</li> <li>RelatedPerson 2</li> <li>Person 2</li> <li>Group 1</li> </ul> <b>Entities #1</b> <ul style="list-style-type: none"> <li>Organization 3</li> <li>OrganizationAffiliation 0</li> <li>HealthcareService 2</li> <li>Endpoint 2</li> <li>Location 3</li> </ul> <b>Entities #2</b> <ul style="list-style-type: none"> <li>Substance 2</li> <li>BiologicallyDerivedProduct 0</li> <li>Device 2</li> <li>DeviceMetric 1</li> <li>NutritionProduct 0</li> </ul> <b>Workflow</b> <ul style="list-style-type: none"> <li>Task 2</li> <li>Appointment 3</li> <li>AppointmentResponse 3</li> <li>Schedule 3</li> <li>Slot 3</li> <li>VerificationResult 0</li> </ul> <b>Management</b> <ul style="list-style-type: none"> <li>Encounter 2</li> <li>EpisodeOfCare 2</li> <li>Flag 1</li> <li>List 1</li> <li>Library 3</li> </ul>					
<b>Clinical</b>	<b>Summary</b> <ul style="list-style-type: none"> <li>AllergyIntolerance 3</li> <li>AdverseEvent 0</li> <li>Condition (Problem) 3</li> <li>Procedure 3</li> <li>FamilyMemberHistory 2</li> <li>ClinicalImpression 0</li> <li>DetectedIssue 1</li> </ul> <b>Diagnostics</b> <ul style="list-style-type: none"> <li>Observation <a href="#">N</a></li> <li>Media 1</li> <li>DiagnosticReport 3</li> <li>Specimen 2</li> <li>BodyStructure 1</li> <li>ImagingStudy 3</li> <li>QuestionnaireResponse 3</li> <li>MolecularSequence 1</li> </ul> <b>Medications</b> <ul style="list-style-type: none"> <li>MedicationRequest 3</li> <li>MedicationAdministration 2</li> <li>MedicationDispense 2</li> <li>MedicationStatement 3</li> <li>Medication 3</li> <li>MedicationKnowledge 0</li> <li>Immunization 3</li> <li>ImmunizationEvaluation 0</li> <li>ImmunizationRecommendation 1</li> </ul> <b>Care Provision</b> <ul style="list-style-type: none"> <li>CarePlan 2</li> <li>CareTeam 2</li> <li>Goal 2</li> <li>ServiceRequest 2</li> </ul> <b>Request &amp; Response</b> <ul style="list-style-type: none"> <li>Communication 2</li> <li>CommunicationRequest 2</li> <li>DeviceRequest 1</li> <li>DeviceUseStatement 0</li> <li>GuidanceResponse 2</li> <li>SupplyRequest 1</li> <li>SupplyDelivery 1</li> </ul>					

# DiagnosticReport

The findings and interpretation of diagnostic tests performed on patients, groups of patients, devices, and locations, and/or specimens derived from these. The report includes clinical context such as requesting and provider information, and some mix of atomic results, images, textual and coded interpretations, and formatted representation of diagnostic reports.

## 10.3.1 Scope and Usage

This resource is an event resource from a FHIR workflow perspective - see [Workflow](#). It is the intent of the Orders and Observation Workgroup to align this resource with the workflow pattern for [event resources](#).

A diagnostic report is the set of information that is typically provided by a diagnostic service when investigations are complete. The information includes a mix of atomic results, text reports, images, and codes. The mix varies depending on the nature of the diagnostic procedure, and sometimes on the nature of the outcomes for a particular investigation. In FHIR, the report can be conveyed in a variety of ways including a [Document](#), [RESTful API](#), or [Messaging](#) framework. Included within each of these, would be the DiagnosticReport resource itself.

The DiagnosticReport resource has information about the diagnostic report itself, and about the subject and, in the case of laboratory tests, the specimen of the report. It can also refer to the request details and atomic observations details or image instances. Report conclusions can be expressed as a simple text blob, structured coded data or as an attached fully formatted report such as a PDF.

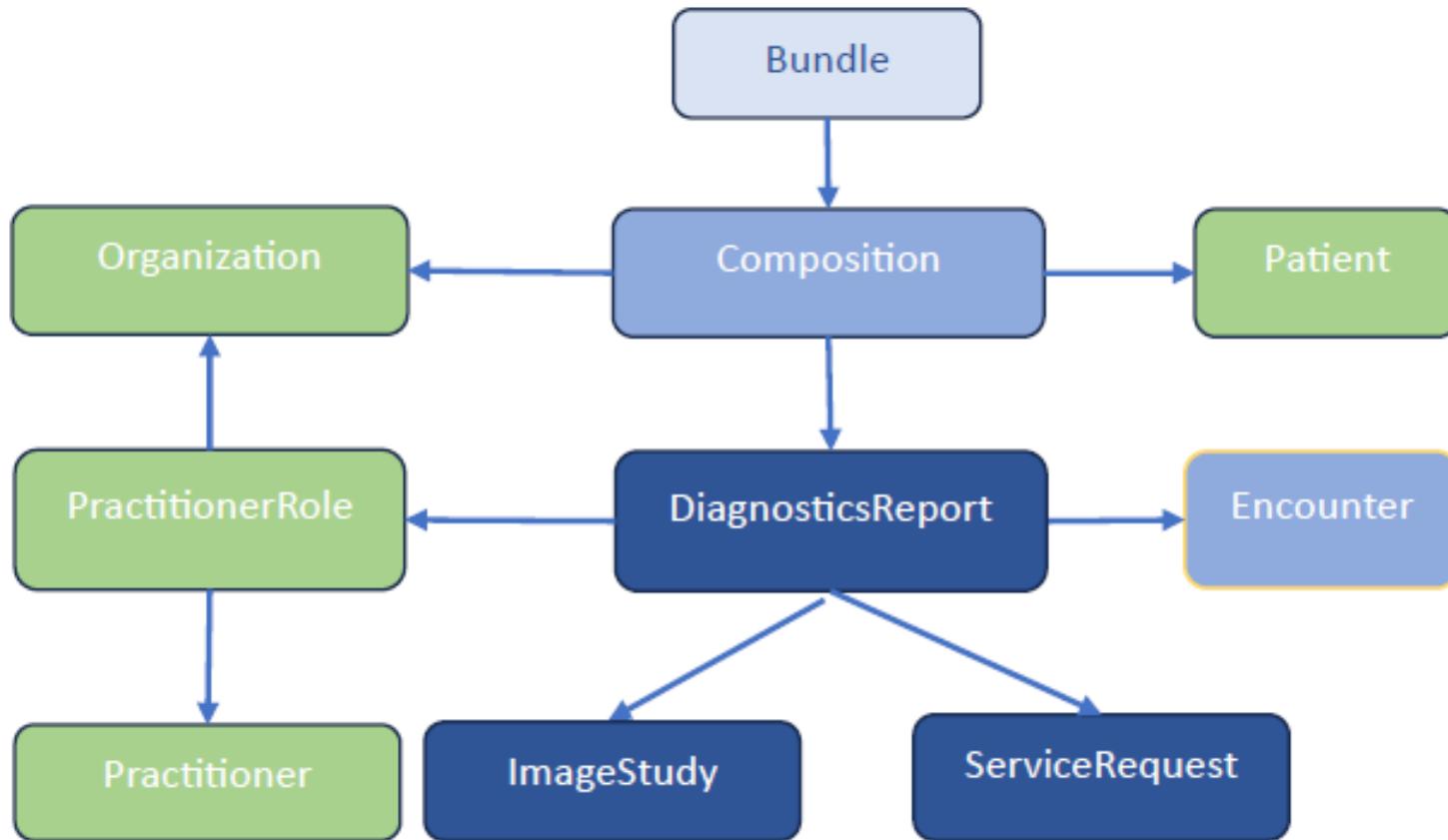
The DiagnosticReport resource is suitable for the following kinds of diagnostic reports:

- Laboratory (Clinical Chemistry, Hematology, Microbiology, etc.)
- Pathology / Histopathology / related disciplines
- Imaging Investigations (x-ray, CT, MRI etc.)
- Other diagnostics - Cardiology, Gastroenterology etc.
- Product quality tests such as pH, Assay, Microbial limits, etc. on product and substance

The DiagnosticReport resource is not intended to support cumulative result presentation (tabular presentation of past and present results in the resource). The DiagnosticReport resource does not yet provide full support for detailed structured reports of sequencing; this is planned for a future release.

<https://www.hl7.org/FHIR/diagnosticreport.html>

# Composition structure for Radiology Examination Record



# DiagnosticReport Structure (Radiology)

Name	Flags	Card.	Type	Description & Constraints	
DiagnosticReport	TU		DomainResource	A Diagnostic report - a combination of request information, atomic results, images, interpretation, as well as formatted reports Elements defined in Ancestors: id, meta, implicitRules, language, text, contained, extension, modifierExtension	
<b>identifier</b>	Σ	0..*	Identifier	Business identifier for report	
<b>basedOn</b>	0..*		Reference(CarePlan   ImmunizationRecommendation   MedicationRequest   NutritionOrder   ServiceRequest)	What was requested	ServiceRequest
<b>status</b>	?!	Σ	1..1	code	registered   partial   preliminary   final + <b>DiagnosticReportStatus (Required)</b>
<b>category</b>	Σ	0..*	CodeableConcept	Service category <b>Diagnostic Service Section Codes (Example)</b>	Report Status
<b>code</b>	Σ	1..1	CodeableConcept	Name/Code for this diagnostic report <b>LOINC Diagnostic Report Codes (Preferred)</b>	Radiology report title
<b>subject</b>	Σ	0..1	Reference(Patient   Group   Device   Location   Organization   Procedure   Practitioner   Medication   Substance)	The subject of the report - usually, but not always, the patient	Patient
<b>encounter</b>	Σ	0..1	Reference(Encounter)	Health care event when test ordered	
<b>effective[x]</b>	Σ	0..1		Clinically relevant time/time-period for report	
<b>effectiveDateTime</b>			dateTime		
<b>effectivePeriod</b>			Period		
<b>issued</b>	Σ	0..1	instant	DateTime this version was made	Radiology report date
<b>performer</b>	Σ	0..*	Reference(Practitioner   PractitionerRole   Organization   Careteam)	Responsible Diagnostic Service	Radiology examination healthcare staff
<b>resultsInterpreter</b>	Σ	0..*	Reference(Practitioner   PractitionerRole   Organization   CareTeam)	Primary result interpreter	Reported by healthcare staff
<b>specimen</b>	0..*		Reference(Specimen)	Specimens this report is based on	
<b>result</b>	0..*		Reference(Observation)	Observations	
<b>imagingStudy</b>	0..*		Reference(ImagingStudy)	Reference to full details of imaging associated with the diagnostic report	ImagingStudy
<b>media</b>	Σ	0..*	BackboneElement	Key images associated with this report	
<b>comment</b>	0..1		string	Comment about the image (e.g. explanation)	
<b>link</b>	Σ	1..1	Reference(Media)	Reference to the image source	
<b>conclusion</b>	0..1		string	Clinical conclusion (interpretation) of test results	Report (Text)
<b>conclusionCode</b>	0..*		CodeableConcept	Codes for the clinical conclusion of test results <b>SNOMED CT Clinical Findings (Example)</b>	
<b>presentedForm</b>	0..*		Attachment	Entire report as issued	Report (PDF)

<https://www.hl7.org/FHIR/diagnosticreport.html>

# ServiceRequest (Radiology)

Name	Flags	Card.	Type	Description & Constraints	
ServiceRequest	TU		DomainResource	A request for a service to be performed + Rule: <i>orderDetail SHALL only be present if code is present</i> Elements defined in Ancestors: <a href="#">id</a> , <a href="#">meta</a> , <a href="#">implicitRules</a> , <a href="#">language</a> , <a href="#">text</a> , <a href="#">contained</a> , <a href="#">extension</a> , <a href="#">modifierExtension</a>	?
<b>identifier</b>	Σ	0..*	Identifier	Identifiers assigned to this order	Radiology registration Number / Referral number
instantiatesCanonical	Σ	0..*	canonical(ActivityDefinition   PlanDefinition)	Instantiates FHIR protocol or definition	
instantiatesUri	Σ	0..*	uri	Instantiates external protocol or definition	
basedOn	Σ	0..*	Reference(CarePlan   ServiceRequest   MedicationRequest)	What request fulfills	
replaces	Σ	0..*	Reference(ServiceRequest)	What request replaces	
<b>requisition</b>	Σ	0..1	Identifier	Composite Request ID	
status	?! Σ	1..1	code	draft   active   on-hold   revoked   completed   entered-in-error   unknown <a href="#">RequestStatus (Required)</a>	
intent	?! Σ	1..1	code	proposal   plan   directive   order   original-order   reflex-order   filler-order   instance-order   option <a href="#">RequestIntent (Required)</a>	
category	Σ	0..*	CodeableConcept	Classification of service <a href="#">Service Request Category Codes (Example)</a>	
priority	Σ	0..1	code	routine   urgent   asap   stat <a href="#">RequestPriority (Required)</a>	
doNotPerform	?! Σ	0..1	boolean	True if service/procedure should not be performed	
<b>code</b>	Σ	0..1	CodeableConcept	What is being requested/ordered <a href="#">Procedure Codes (SNOMED CT) (Example)</a>	Radiology examination name
orderDetail	Σ I	0..*	CodeableConcept	Additional order information <a href="#">Service Request Order Details Codes (Example)</a>	
...					
occurrence[x]	Σ	0..1		When service should occur	
occurrenceDateTime			dateTime		Radiology registration datetime
occurrencePeriod			Period		

<https://www.hl7.org/FHIR/servicerequest.html>

# imagingStudy Structure

Name	Flags	Card.	Type	Description & Constraints	
ImagingStudy	TU		DomainResource	A set of images produced in single study (one or more series of references images) Elements defined in Ancestors: id, meta, implicitRules, language, text, contained, extension, modifierExtension	
identifier	Σ	0..*	Identifier	Identifiers for the whole study	accession number
status	?! Σ	1..1	code	registered   available   cancelled   entered-in-error   unknown <a href="#">ImagingStudyStatus (Required)</a>	
modality	Σ	0..*	Coding	All series modality if actual acquisition modalities <a href="#">AcquisitionModality (Extensible)</a>	modality code
subject	Σ	1..1	Reference(Patient   Device   Group)	Who or what is the subject of the study	
encounter	Σ	0..1	Reference(Encounter)	Encounter with which this imaging study is associated	
started	Σ	0..1	dateTime	When the study was started	examination datetime
basedOn	Σ	0..*	Reference(CarePlan   ServiceRequest   Appointment   AppointmentResponse   Task)	Request fulfilled	
referrer	Σ	0..1	Reference(Practitioner   PractitionerRole)	Referring physician	
interpreter	Σ	0..*	Reference(Practitioner   PractitionerRole)	Who interpreted images	
endpoint	Σ	0..*	Reference(Endpoint)	Study access endpoint	
numberOfSeries	Σ	0..1	unsignedInt	Number of Study Related Series	
numberOfInstances	Σ	0..1	unsignedInt	Number of Study Related Instances	

<https://www.hl7.org/FHIR/imagingstudy.html>

# imagingStudy Example

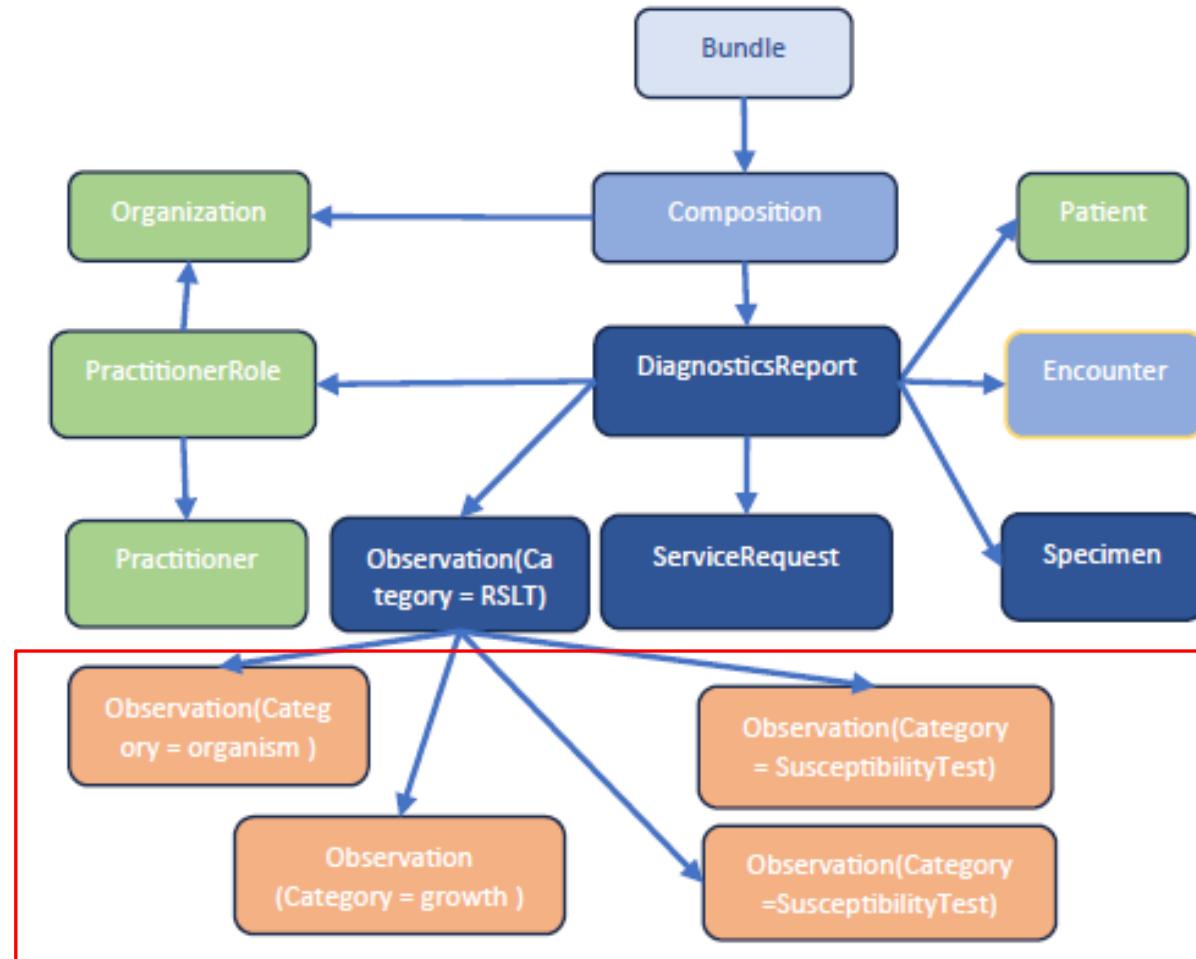
```
,  
{  
    "fullUrl": "ImagingStudy/c220e36c-eb67-4fc4-9ba1-2fabc52acec6",  
    "resource": {  
        "resourceType": "ImagingStudy",  
        "id": "c220e36c-eb67-4fc4-9ba1-2fabc52acec6",  
        "identifier": [  
            {  
                "system": "http://ehealth.gov.hk/FHIR/accessionNo",  
                "value": "A1223456789012345"  
            }  
        ],  
        "status": "available",  
        "modality": [  
            {  
                "system": "https://ehealth.gov.hk/FHIR/modality",  
                "code": "MRI"  
            }  
        ],  
        "started": "2023-10-20T14:30:00.000+08:00"  
    }  
}
```

Accession number

modality code

examination datetime

# Composition structure for Laboratory Record (Microbiology)



# Observation

## 10.1 Resource Observation - Content

Orders and Observations  Work Group	Maturity Level: N	Normative (from v4.0.0)	Security Category: Patient	Compartments: Device, Encounter, Patient, Practitioner, RelatedPerson
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This page has been approved as part of an [ANSI](#) standard. See the [Observation Package](#) for further details.

Measurements and simple assertions made about a patient, device or other subject.

### 10.1.1 Scope and Usage

This resource is an [event resource](#) from a FHIR workflow perspective - see [Workflow](#).

Observations are a central element in healthcare, used to support diagnosis, monitor progress, determine baselines and patterns and even capture demographic characteristics. Most observations are simple name/value pair assertions with some metadata, but some observations group other observations together logically, or even are multi-component observations. Note that the [DiagnosticReport](#) resource provides a clinical or workflow context for a set of observations and the Observation resource is referenced by DiagnosticReport to represent laboratory, imaging, and other clinical and diagnostic data to form a complete report.

Uses for the Observation resource include:

- Vital signs such as [body weight](#), [blood pressure](#), and [temperature](#)
- Laboratory Data like [blood glucose](#), or an [estimated GFR](#)
- Imaging results like [bone density](#) or fetal measurements
- Clinical Findings\* such as [abdominal tenderness](#)
- Device measurements such as [EKG data](#) or [Pulse Oximetry data](#)
- Clinical assessment tools such as [APGAR](#) or a [Glasgow Coma Score](#)
- Personal characteristics: such as [eye-color](#)
- Social history like tobacco use, family support, or cognitive status
- Core characteristics like pregnancy status, or a death assertion

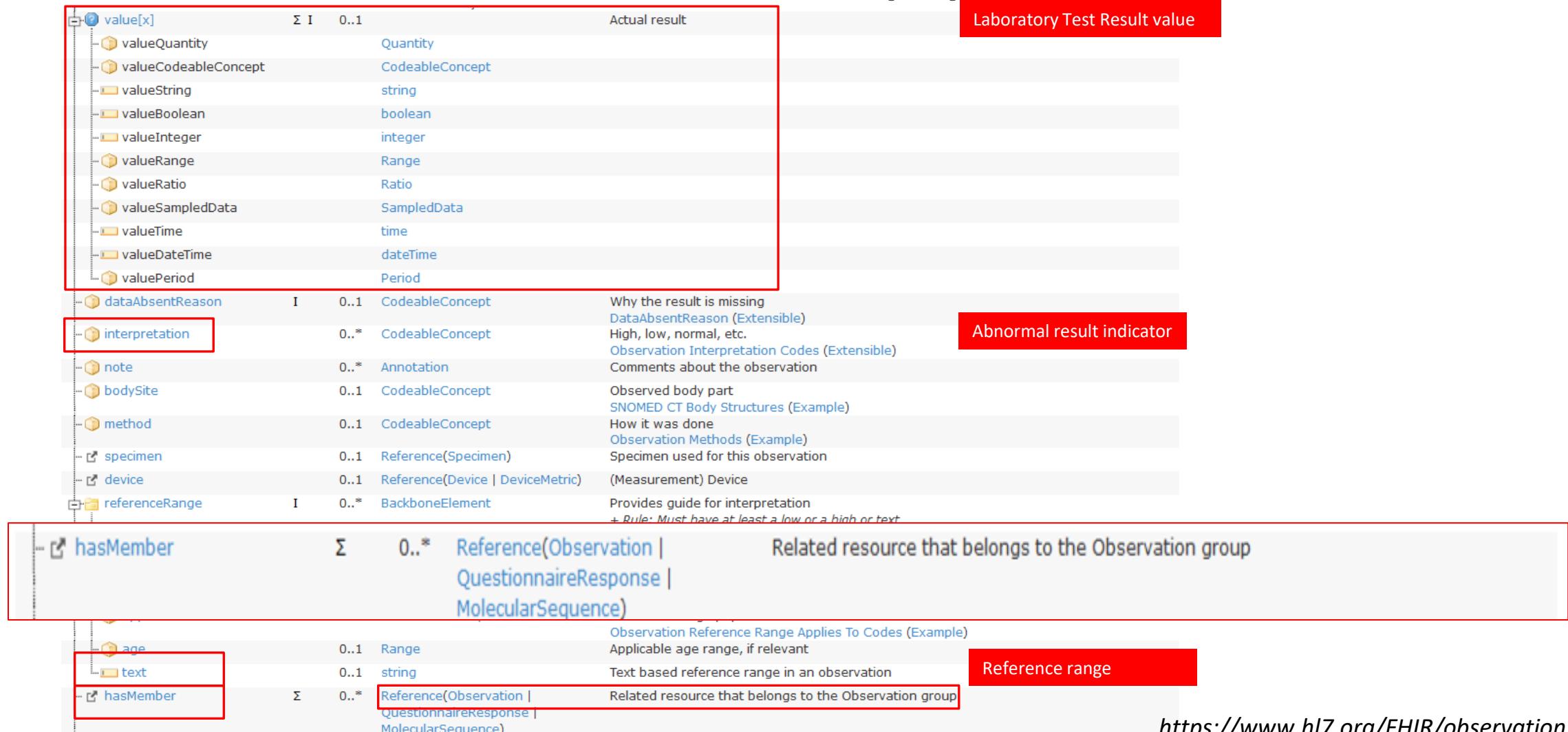
\*The boundaries between clinical findings and disorders remains a challenge in medical ontology. Refer the [Boundaries](#) section below and in [Condition](#) for general guidance. These boundaries can be clarified by profiling Observation for a particular use case.

# Observation Structure (1)

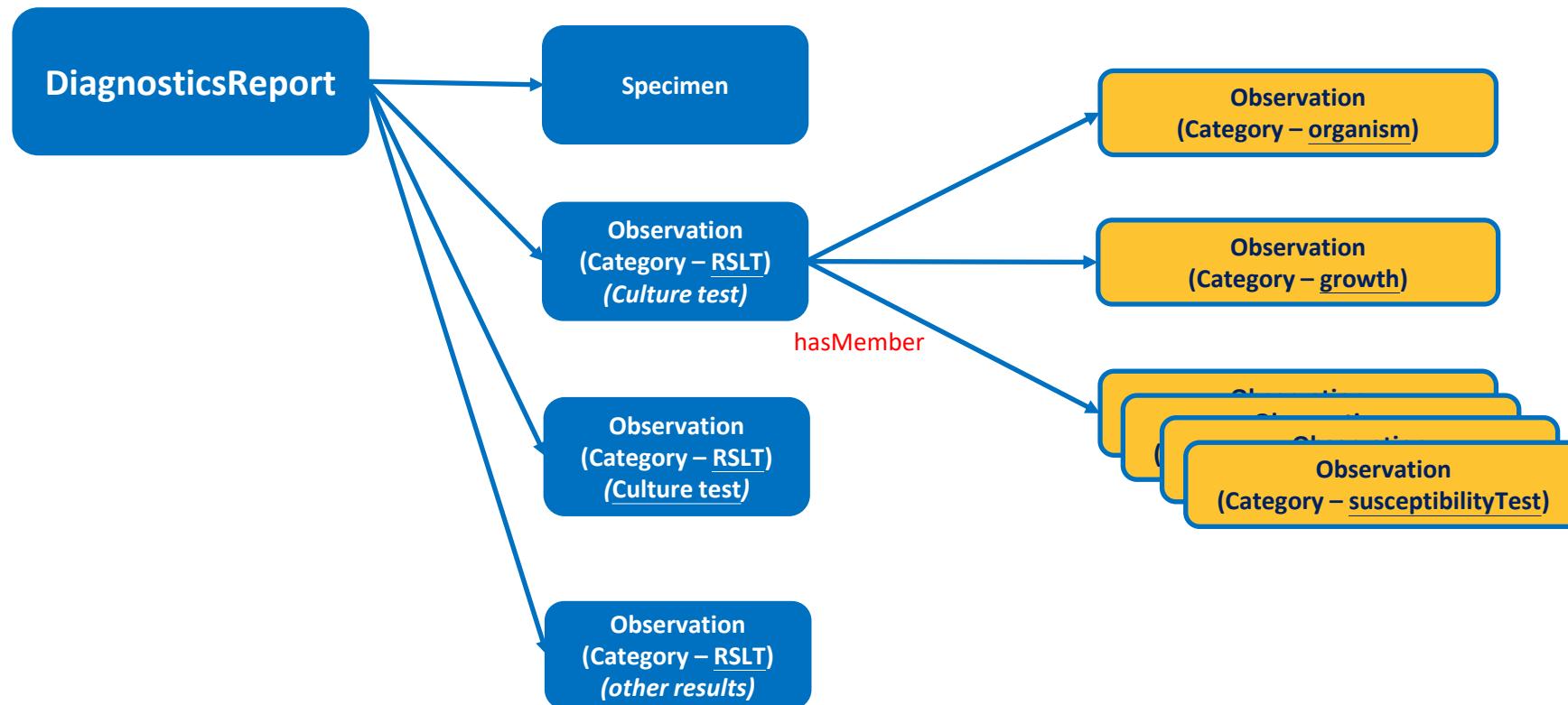
Name	Flags	Card.	Type	Description & Constraints	
Observation	N		DomainResource	Measurements and simple assertions + Rule: <i>dataAbsentReason SHALL only be present if Observation.value[x] is not present</i> + Rule: <i>If Observation.code is the same as an Observation.component.code then the value element associated with the code SHALL NOT be present</i> Elements defined in Ancestors: <a href="#">id</a> , <a href="#">meta</a> , <a href="#">implicitRules</a> , <a href="#">language</a> , <a href="#">text</a> , <a href="#">contained</a> , <a href="#">extension</a> , <a href="#">modifierExtension</a>	
<b>identifier</b>	Σ	0..*	Identifier	Business Identifier for observation	
<b>basedOn</b>	Σ	0..*	Reference(CarePlan   DeviceRequest   ImmunizationRecommendation   MedicationRequest   NutritionOrder   ServiceRequest)	Fulfils plan, proposal or order	
<b>partOf</b>	Σ	0..*	Reference(MedicationAdministration   MedicationDispense   MedicationStatement   Procedure   Immunization   ImagingStudy)	Part of referenced event	
<b>status</b>	?!	Σ	1..1	code	registered   preliminary   final   amended + <a href="#">ObservationStatus (Required)</a>
<b>category</b>		0..*	CodeableConcept	Classification of type of observation <a href="#">Observation Category Codes (Preferred)</a>	
<b>code</b>	Σ	1..1	CodeableConcept	Type of observation (code / type) <a href="#">LOINC Codes (Example)</a>	
<b>subject</b>	Σ	0..1	Reference(Patient   Group   Device   Location   Organization   Procedure   Practitioner   Medication   Substance)	Who and/or what the observation is about	
<b>focus</b>	Σ <b>TU</b>	0..*	Reference(Any)	What the observation is about, when it is not about the subject of record	
<b>encounter</b>	Σ	0..1	Reference(Encounter)	Healthcare event during which this observation is made	
<b>effective[x]</b>	Σ	0..1		Clinically relevant time/time-period for observation	
<b>effectiveDateTime</b>			dateTime		
<b>effectivePeriod</b>			Period		
<b>effectiveTiming</b>			Timing		
<b>effectiveInstant</b>			instant		
<b>issued</b>	Σ	0..1	instant	Date/Time this version was made available	
<b>performer</b>	Σ	0..*	Reference(Practitioner   PractitionerRole   Organization   CareTeam   Patient   RelatedPerson)	Who is responsible for the observation	

<https://www.hl7.org/FHIR/observation.html>

# Observation Structure (2)



# Structure



# Observation Example (Culture test)

{ "fullUrl": "Observation/76bee290-2832-43e1-81b3-a15a911bd960", "resource": { "resourceType": "Observation", "id": "76bee290-2832-43e1-81b3-a15a911bd960", "extension": [ { "url": "https://ehealth.gov.hk/FHIR/99999999-LabTestResultType", "valueDecimal": 3 }, { "url": "https://ehealth.gov.hk/FHIR/99999999-STresultIndicator", "valueString": "1" } ], "status": "final", "category": [ { "coding": [ { "code": "RSLT" } ] } ], "code": { "coding": [ { "system": "https://ehealth.gov.hk/FHIR/HKCTT", "code": "5200597", "display": "Bacteria identified in Unspecified specimen by Respiratory culture" }, { "system": "https://ehealth.gov.hk/FHIR/HCP/local/LabTest", "code": "SP_ORG", "display": "Sputum culture :" } ] }, "subject": { "reference": "Patient/61bcd785-9147-4d72-99e0-e0cf17ede1d5" }, "hasMember": [ { "reference": "Observation/b7c113c5-0e9e-43e7-9a6d-e1b60a374487" }, { "reference": "Observation/817b0215-cd37-438f-a36e-ff86d981b9d5" }, { "reference": "Observation/8d78cb40-049f-40ed-a135-8887416403f3" } ] }	Organism and susceptibility test result indicator	[Organism and susceptibility test result indicator] Indicator for existence of organism, sensitive or susceptibility test result and related property
	0: no organism, sensitive or susceptibility test result and related property data provided 1: organism, sensitive or susceptibility test result and related property data provided	
	"Organism" reference	
	"Organism growth" reference	
	"Susceptibility test" reference	

# Observation Example (Organism)

```
{  
    "fullUrl": "Observation/b7c113c5-0e9e-43e7-9a6d-e1b60a374487",  
    "resource": {  
        "resourceType": "Observation",  
        "id": "b7c113c5-0e9e-43e7-9a6d-e1b60a374487",  
        "identifier": [  
            {  
                "value": "C&ST|SP_ORG|1|1"  
            }  
        ],  
        "status": "final",  
        "category": [  
            {  
                "coding": [  
                    {  
                        "code": "organism"  
                    }  
                ]  
            }  
        ],  
        "code": {  
            "coding": [  
                {  
                    "system": "https://ehealth.gov.hk/FHIR/HKCTT",  
                    "code": "5003429",  
                    "display": "Klebsiella pneumoniae complex"  
                },  
                {  
                    "system": "https://ehealth.gov.hk/FHIR/HCP/local/LabTest",  
                    "code": "32597",  
                    "display": "Klebsiella pneumoniae complex"  
                }  
            ]  
        }  
    }  
},  
}
```

Organism

# Observation Example (Organism growth)

```
{  
    "fullUrl": "Observation/817b0215-cd37-438f-a36e-ff86d981b9d5",  
    "resource": {  
        "resourceType": "Observation",  
        "id": "817b0215-cd37-438f-a36e-ff86d981b9d5",  
        "status": "final",  
        "category": [  
            {  
                "coding": [  
                    {  
                        "code": "growth"  
                    }  
                ]  
            }  
        ],  
        "code": {  
            "extension": [  
                {  
                    "url": "http://hl7.org/fhir/StructureDefinition/data-absent-reason",  
                    "valueCode": "not-applicable"  
                }  
            ]  
        },  
        "valueString": "Heavy growth"  
    },  
},  

```

Organism growth description text result

# Observation Example (Susceptibility Test)

```
{  
    "fullUrl": "Observation/8d78cb40-049f-40ed-a135-8887416403f3",  
    "resource": {  
        "resourceType": "Observation",  
        "id": "8d78cb40-049f-40ed-a135-8887416403f3",  
        "identifier": [  
            {  
                "system": "https://ehealth.gov.hk/HCPID/STSeqNum",  
                "value": "1"  
            }  
        ],  
        "status": "final",  
        "category": [  
            {  
                "coding": [  
                    {  
                        "code": "susceptibilityTest"  
                    }  
                ]  
            }  
        ]  
    },  
    "code": {  
        "coding": [  
            {  
                "system": "https://ehealth.gov.hk/FHIR/HKCTT",  
                "code": "5200017",  
                "display": "Amoxicillin+Clavulanate [Susceptibility]"  
            },  
            {  
                "system": "https://ehealth.gov.hk/FHIR/HCP/local/LabTest",  
                "code": "22494",  
                "display": "Amoxycillin/clavulanate"  
            }  
        ]  
    },  
    "valueCodeableConcept": {  
        "coding": [  
            {  
                "system": "https://ehealth.gov.hk/FHIR/HCP/local/STLocalcode",  
                "code": "S",  
                "display": "Sensitive"  
            }  
        ],  
        "text": "Sensitive"  
    }  
},  
Susceptibility Test  
Susceptibility Test Result
```

# Observation Example (Other result 1)

```
{  
    "fullUrl": "Observation/066699a4-94d9-4bd8-8343-af43dae1421f",  
    "resource": {  
        "resourceType": "Observation",  
        "id": "066699a4-94d9-4bd8-8343-af43dae1421f",  
        "extension": [  
            {  
                "url": "https://ehealth.gov.hk/FHIR/99999999-LabTestResultType",  
                "valueDecimal": 3  
            },  
            {  
                "url": "https://ehealth.gov.hk/FHIR/1003545-LabReportableResult",  
                "valueString": "Purulent Blood-stained"  
            },  
            {  
                "url": "https://ehealth.gov.hk/FHIR/99999999-STresultIndicator",  
                "valueString": "0"  
            },  
            {  
                "url": "https://ehealth.gov.hk/FHIR/1003554-LabTestTextResult",  
                "valueString": "Purulent Blood-stained"  
            }  
        ],  
        "status": "final",  
        "category": [  
            {  
                "coding": [  
                    {  
                        "code": "RSLT"  
                    }  
                ]  
            }  
        ],  
        "code": {  
            "coding": [  
                {  
                    "system": "https://ehealth.gov.hk/FHIR/HKCTT",  
                    "code": "5201283",  
                    "display": "Appearance of Sputum"  
                },  
                {  
                    "system": "https://ehealth.gov.hk/FHIR/HCP/local/LabTest",  
                    "code": "SP_APP",  
                    "display": "Appearance :"  
                }  
            ]  
        },  
        "text": {  
            "status": "generated",  
            "div": "

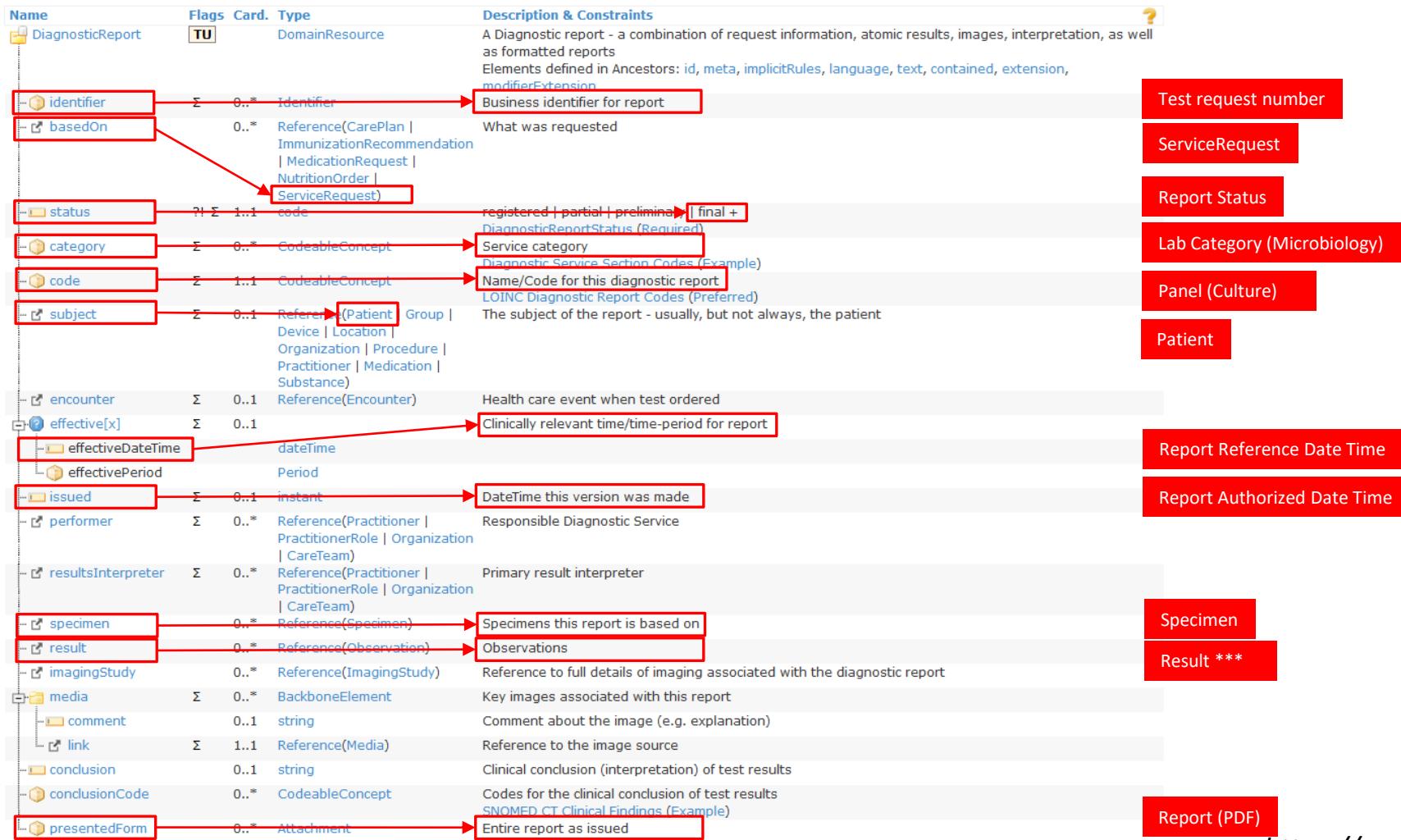
Purulent Blood-stained

"  
        }  
    }  
}
```

# Observation Example (Other result 2)

```
{  
    "fullUrl": "Observation/951528f7-04b3-41d1-9943-7fb145f0b403",  
    "resource": {  
        "resourceType": "Observation",  
        "id": "951528f7-04b3-41d1-9943-7fb145f0b403",  
        "extension": [  
            {  
                "url": "https://ehealth.gov.hk/FHIR/99999999-LabTestResultType",  
                "valueDecimal": 3  
            },  
            {  
                "url": "https://ehealth.gov.hk/FHIR/1003545-LabReportableResult",  
                "valueString": "Moderate numbers of WBC seen A few epithelial cell seen"  
            },  
            {  
                "url": "https://ehealth.gov.hk/FHIR/99999999-STresultIndicator",  
                "valueString": "0"  
            },  
            {  
                "url": "https://ehealth.gov.hk/FHIR/1003554-LabTestTextResult",  
                "valueString": "Moderate numbers of WBC seen A few epithelial cell seen"  
            }  
        ],  
        "status": "final",  
        "category": [  
            {  
                "coding": [  
                    {  
                        "code": "RSLT"  
                    }  
                ]  
            }  
        ],  
        "code": {  
            "coding": [  
                {  
                    "system": "https://ehealth.gov.hk/FHIR/HKCTT",  
                    "code": "5201463",  
                    "display": "Microscopic observation [Identifier] in Unspecified specimen by Smear"  
                },  
                {  
                    "system": "https://ehealth.gov.hk/FHIR/HCP/local/LabTest",  
                    "code": "SP_GRAM",  
                    "display": "Microscopy :"  
                }  
            ]  
        },  
        "subject": {}  
    }  
}
```

# DiagnosticReport Structure



<https://www.hl7.org/FHIR/diagnosticreport.html>

# DiagnosticReport (LABMB) Example

```
{  
    "fullUrl": "DiagnosticReport/ec29dc37-8fac-437c-a7e7-4e0a1b2b4430",  
    "resource": {  
        "resourceType": "DiagnosticReport",  
        "id": "ec29dc37-8fac-437c-a7e7-4e0a1b2b4430",  
        "meta": {  
            "versionId": "1",  
            "lastUpdated": "2022-09-27T15:22:56.319+08:00"  
        },  
        "extension": [  
            {  
                "url": "https://ehealth.gov.hk/FHIR/1003526-LabReportComment",  
                "valueString": "There are no zone diameter breakpoints in the CLSI standard .."  
            },  
            {  
                "url": "https://ehealth.gov.hk/FHIR/1003520-LabReportStatusDesc",  
                "valueString": "Unspecified report status"  
            },  
            {  
                "url": "https://ehealth.gov.hk/FHIR/1003521-LabReportStatusLocalDesc",  
                "valueString": "Unspecified"  
            }  
        ],  
        "identifier": [  
            {  
                "system": "https://ehealth.gov.hk/FHIR/HCP/local/RequestNum",  
                "value": "22B2162542"  
            }  
        ],  
        "basedOn": [  
            {  
                "reference": "ServiceRequest/63706305-46ec-4e54-8aaaf-844810d8d8f2"  
            }  
        ],  
        "status": "unknown",  
        "category": [  
            {  
                "coding": [  
                    {  
                        "system": "https://ehealth.gov.hk/FHIR/LabCatCode",  
                        "code": "MICRO",  
                        "display": "Microbiology & Virology"  
                    }  
                ],  
                "text": "Microbiology"  
            }  
        ],  
        "code": {  
            "coding": [  
                {  
                    "system": "https://ehealth.gov.hk/FHIR/HCP/local/PanelCode",  
                    "code": "SP_CUL",  
                    "display": "Sputum Culture"  
                }  
            ]  
        },  
        "subject": {  
            "reference": "Patient/61bcd785-9147-4d72-99e0-e0cf17ede1d5"  
        },  
        "effectiveDateTime": "2022-03-24T10:45:00.000+08:00",  
        "issued": "2022-03-26T16:06:09.000+08:00",  
        "performer": [  
            {  
                "reference": "PractitionerRole/2e804d1b-b517-451a-b66a-ed3fcbebd8f82"  
            }  
        ],  
        "specimen": [  
            {  
                "reference": "Specimen/12345678-90ab-cdef-3456-789012345678"  
            }  
        ]  
    }  
}
```

The diagram illustrates the structure of a DiagnosticReport resource (LABMB) with various components highlighted by red boxes:

- Report Status**: The status field, which is currently set to "unknown".
- Lab Category**: The category field, which includes a coding array for "MICRO" and a text value of "Microbiology".
- Panel**: The code field, which includes a coding array for "SP\_CUL" and a display value of "Sputum Culture".
- Report Reference Date Time**: The effectiveDateTime and issued fields, both set to specific dates and times.
- Test request number**: The identifier array, specifically the RequestNum entry with value "22B2162542".
- ServiceRequest**: The basedOn array, specifically the ServiceRequest entry with reference "ServiceRequest/63706305-46ec-4e54-8aaaf-844810d8d8f2".

# ServiceRequest

Name	Flags	Card.	Type	Description & Constraints	
ServiceRequest	TU		DomainResource	A request for a service to be performed + Rule: <i>orderDetail SHALL only be present if code is present</i> Elements defined in Ancestors: id, meta, implicitRules, language, text, contained, extension, modifierExtension	?
- identifier	Σ	0..*	Identifier	Identifiers assigned to this order	Laboratory test order number (e-Referral number)
- instantiatesCanonical	Σ	0..*	canonical(ActivityDefinition   PlanDefinition)	Instantiates FHIR protocol or definition	
- instantiatesUri	Σ	0..*	uri	Instantiates external protocol or definition	
- basedOn	Σ	0..*	Reference(CarePlan   ServiceRequest   MedicationRequest)	What request fulfills	
- replaces	Σ	0..*	Reference(ServiceRequest)	What request replaces	
- requisition	Σ	0..1	Identifier	Composite Request ID	
- status	?!	Σ 1..1	code	draft   active   on-hold   revoked   completed   entered-in-error   unknown <a href="#">RequestStatus (Required)</a>	
- intent	?!	Σ 1..1	code	proposal   plan   directive   order   original-order   reflex-order   filler-order   instance-order   option <a href="#">RequestIntent (Required)</a>	
- category	Σ	0..*	CodeableConcept	Classification of service <a href="#">Service Request Category Codes (Example)</a>	
- priority	Σ	0..1	code	routine   urgent   asap   stat <a href="#">RequestPriority (Required)</a>	
- doNotPerform	?!	Σ 0..1	boolean	True if service/procedure should not be performed	
- code	Σ	0..1	CodeableConcept	What is being requested/ordered <a href="#">Procedure Codes (SNOMED CT) (Example)</a>	
- orderDetail	Σ I	0..*	CodeableConcept	Additional order information <a href="#">Service Request Order Details Codes (Example)</a>	

<https://www.hl7.org/FHIR/servicerequest.html>

# ServiceRequest Example

```
{  
    "fullUrl": "ServiceRequest/63706305-46ec-4e54-8aaf-844810d8d8f2",  
    "resource": {  
        "resourceType": "ServiceRequest",  
        "id": "63706305-46ec-4e54-8aaf-844810d8d8f2",  
        "identifier": [  
            {  
                "system": "https://ehealth.gov.hk/FHIR/HCP/local/OrderNum",  
                "value": "8088450656:1234567890000111555"  
            }  
        ],  
        "status": "completed",  
        "intent": "order",  
        "subject": {  
            "reference": "Patient/61bcd785-9147-4d72-99e0-e0cf17ede1d5"  
        },  
        "encounter": {  
            "reference": "Encounter/9b8f0753-1f9b-43b4-ba29-1850448ef70a"  
        },  
        "requester": {  
            "reference": "PractitionerRole/5d7ed8e9-73e7-4dd1-a348-9b4b8d0d8312"  
        },  
        "supportingInfo": [  
            {  
                "display": "Ca lung"  
            }  
        ]  
    }  
},
```

Lab test order number

# Specimen

Name	Flags	Card.	Type	Description & Constraints	
Specimen	TU		DomainResource	Sample for analysis Elements defined in Ancestors: id, meta, implicitRules, language, text, contained, extension, modifierExtension	
identifier	Σ	0..*	Identifier	External Identifier	
accessionIdentifier	Σ	0..1	Identifier	Identifier assigned by the lab	
status	?! Σ	0..1	code	available   unavailable   unsatisfactory   entered-in-error <a href="#">SpecimenStatus (Required)</a>	
type	Σ	0..1	CodeableConcept	Kind of material that forms the specimen <a href="#">hl7v3-specimenType</a> (Example)	Specimen Type
subject	Σ	0..1	Reference(Patient   Group   Device   Substance   Location)	Where the specimen came from. This may be from patient(s), from a location (e.g., the source of an environmental sample), or a sampling of a substance or a device	
receivedTime	Σ	0..1	dateTime	The time when specimen was received for processing	Specimen arrival datetime
parent		0..*	Reference(Specimen)	Specimen from which this specimen originated	
request		0..*	Reference(ServiceRequest)	Why the specimen was collected	
collection		0..1	BackboneElement	Collection details	
collector	Σ	0..1	Reference(Practitioner   PractitionerRole)	Who collected the specimen	
collected[x]	Σ	0..1		Collection time	Specimen collection datetime
collectedDateTime			dateTime		
collectedPeriod			Period		

<https://www.hl7.org/FHIR//specimen.html>

# Specimen (LABMB) Example

```
{  
    "fullUrl": "Specimen/2f9d2a2c-989d-41f4-87dc-ba8714eb54a6",  
    "resource": {  
        "resourceType": "Specimen",  
        "id": "2f9d2a2c-989d-41f4-87dc-ba8714eb54a6",  
        "extension": [  
            {  
                "url": "https://ehealth.gov.hk/FHIR/1003530-SpecimenDetail",  
                "valueString": "Red cap of the Hickman line"  
            }  
        ],  
        "type": {  
            "coding": [  
                {  
                    "system": "https://ehealth.gov.hk/FHIR/HCP/local/SpecimenType",  
                    "code": "23164",  
                    "display": "SPUTUM"  
                },  
                {  
                    "system": "https://ehealth.gov.hk/FHIR/HKCTT",  
                    "code": "5700284",  
                    "display": "Sputum"  
                }  
            ]  
        },  
        "subject": {  
            "reference": "Patient/61bcd785-9147-4d72-99e0-e0cf17ede1d5"  
        },  
        "receivedTime": "2022-03-24T14:40:00.000+08:00",  
        "request": [  
            {  
                "reference": "ServiceRequest/63706305-46ec-4e54-8aaaf-844810d8d8f2"  
            }  
        ],  
        1.  
        "collection": {  
            "collectedDateTime": "2022-03-24T10:45:00.000+08:00"  
        }  
    },  
}
```

Specimen details

Specimen type

Specimen arrival datetime

Specimen collection datetime

# Laboratory report (PDF)

Name	Flags	Card.	Type	Description & Constraints
DiagnosticReport	TU		DomainResource	A Diagnostic report - a combination of request information, atomic results, images, interpretation, as well as formatted reports Elements defined in Ancestors: <a href="#">id</a> , <a href="#">meta</a> , <a href="#">implicitRules</a> , <a href="#">language</a> , <a href="#">text</a> , <a href="#">contained</a> , <a href="#">extension</a> , <a href="#">modifierExtension</a>
identifier	Σ	0..*	Identifier	Business identifier for report
basedOn		0..*	Reference(CarePlan   ImmunizationRecommendation   MedicationRequest   NutritionOrder   ServiceRequest)	What was requested
status	?! Σ	1..1	CodeableConcept	registered   partial   preliminary   final + <a href="#">DiagnosticReportStatus (Required)</a>
category	Σ	0..*	CodeableConcept	Service category <a href="#">Diagnostic Service Section Codes (Example)</a>
code	Σ	1..1	CodeableConcept	Name/Code for this diagnostic report <a href="#">LOINC Diagnostic Report Codes (Preferred)</a>
subject	Σ	0..1	Reference(Patient   Group   Device   Location   Organization   Procedure   Practitioner   Medication   Substance)	The subject of the report - usually, but not always, the patient
encounter	Σ	0..1	Reference(Encounter)	Health care event when test ordered
effective[x]	Σ	0..1		Clinically relevant time/time-period for report
effectiveDateTime			dateTime	
effectivePeriod			Period	
issued	Σ	0..1	instant	DateTime this version was made
performer	Σ	0..*	Reference(Practitioner   PractitionerRole   Organization   CareTeam)	Responsible Diagnostic Service
resultsInterpreter	Σ	0..*	Reference(Practitioner   PractitionerRole   Organization   CareTeam)	Primary result interpreter
specimen		0..*	Reference(Specimen)	Specimens this report is based on
result		0..*	Reference(Observation)	Observations
imagingStudy		0..*	Reference(ImagingStudy)	Reference to full details of imaging associated with the diagnostic report
media	Σ	0..*	BackboneElement	Key images associated with this report
comment		0..1	string	Comment about the image (e.g. explanation)
link	Σ	1..1	Reference(Media)	Reference to the image source
conclusion		0..1	string	Clinical conclusion (interpretation) of test results



[presentedForm](#)

0..\* [Attachment](#)

[Entire report as issued](#)

# Attachment

Name	Flags	Card.	Type	Description & Constraints	?
Attachment	N		Element	Content in a format defined elsewhere + Rule: If the Attachment has data, it SHALL have a contentType Elements defined in Ancestors: id, extension	
contentType	Σ	0..1	code	Mime type of the content, with charset etc. <a href="#">MimeType (Required)</a>	application/pdf
language	Σ	0..1	code	Human language of the content (BCP-47) <a href="#">Common Languages (Preferred but limited to All languages)</a>	
data		0..1	base64Binary	Data inline, base64ed	
url	Σ	0..1	url	Uri where the data can be found	
size	Σ	0..1	unsignedInt	Number of bytes of content (if url provided)	
hash	Σ	0..1	base64Binary	Hash of the data (sha-1, base64ed)	
title	Σ	0..1	string	Label to display in place of the data	
creation	Σ	0..1	dateTime	Date attachment was first created	

# PDF size limit

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- The size of PDF embedded is limited to 10MB

# Challenge

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# Specifications

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- Specifications can be found at
  - <https://github.com/hl7hongkong/HL7-Hong-Kong-FHIR-Connectathon-202503/>

The screenshot shows a GitHub repository page. At the top, the URL is [github.com/hl7hongkong/HL7-Hong-Kong-FHIR-Connectathon-202503/](https://github.com/hl7hongkong/HL7-Hong-Kong-FHIR-Connectathon-202503/). The repository name is **hl7hongkong / HL7-Hong-Kong-FHIR-Connectathon-202503**, marked as Public. Below the header, there are navigation links for Product, Solutions, Resources, Open Source, Enterprise, and Pricing. The main content area shows the repository's structure: a main branch, 1 branch, 0 tags, and a search bar with 'Go to file'. A green 'Code' button is highlighted. Below this, a list of files includes 'Part\_1\_Laboratory\_Record-Microbiology\_(Cu...)', 'Part\_2\_Radiology\_Examination', and 'README.md', all updated by MichaelCheung-FHIR last week. At the bottom, a large heading reads: **The 6th Connectathon of HL7 Hong Kong FHIR® Connectathon Series 2024-25**.

# Exercise

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- Following the instructions at the GitHub
  - Submit the answers via
    - Fork the repository by pull request and update the related files
    - Google Form
      - <https://forms.gle/6b1kSw6h9ereYsqN8>

# Format of the exercise

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- Based on the scenario, select the correct answer (multiple choice)

# Open Discussion

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# Closing remarks

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By

Mr Pascal Tse (Vice Chairman, HL7 Hong Kong)

# Connectathon Series 2025

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## Sixth FHIR Connectathon

**Topics: Laboratory Record (Microbiology) & Radiology Examination Record**

- Part 1: Face to face Session (24 Mar 2025)
- Part 2: Online Follow-up Meetings

Zoom Sessions	Time
Mar 28, 2025	Time: 7pm

**What's next?**

# Proposed Schedule of Connectathon

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	Date	Topics
1	Nov 2023	Patient Encounter, Medication, GOPC PPP data download
2	Feb 2024	Allergy/ADR, Immunisation
3	6 May 2024	Problem, Procedure
4	5 Aug 2024	Clinical Note / Summary, Investigation report, Referral, Medical Certificate
5	21 Oct 2024	Laboratory Record (General) & Laboratory Record (Anatomical Pathology)
6	24 Mar 2025	Laboratory Record (Microbiology), Radiology
7	May-Jun 2025	PMI, Chinese Medicine

See you soon

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