HL7 FHIR adoption in European lab systems: A look at Sweden

Webinar, 13 March 2025

16.00-17.00 CET

Online on Teams

HL7® Europe

HL7 Europe Labs-on-FHIR webinar series

A succession of open, online educational sessions 2023-25
related to the adoption of FHIR specifications
in Europe's laboratory systems and
the HL7 Europe FHIR Implementation Guide for Laboratory Reports

HL7 FHIR adoption in European lab systems: A look at Sweden

Speaker introductions

- Presenters:
  - Daniel Karlsson, The Swedish eHealth Agency (E-hälsomyndigheten)
  - Gunnar Nordin, Equalis AB
- Panel:
  - Prof Sylvia Thun, Charité Hospital Berlin, HL7 Germany
  - Jean-Michel Polfliet, eHealth Platform (BE)
  - Giorgio Cangioli, HL7 Europe
- Facilitator: Michael Strübin, HL7 Europe

Housekeeping

- Your facilitator: Michael Strübin, HL7 Europe
- The webinar will be recorded, slides will be shared in pdf.
- To help ensure a successful webinar please:
  - Stay muted
  - Feel free to use reactions/emojis during the presentations
  - Use the chat to make comments or raise your questions
  - Raise your hand if you'd like to speak
  - If you are invited to speak, please turn on your video and say who you are

HL7 FHIR adoption in European lab systems: A look at Sweden

Agenda

- Welcome and introductions
- A look at Sweden:
  - Daniel Karlsson, The Swedish eHealth Agency (E-hälsomyndigheten)
  - Gunnar Nordin, Equalis AB
- Panel:
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- Discussion and Q&A
- Next steps

End

eHälsomyndigheten

HL7 FHIR adoption in European lab systems: a look at Sweden

Daniel Karlsson (SeHA), Gunnar Nordin (Equalis AB)

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HL7 Sweden

eHälsomyndigheten

Agenda

- Laboratory services and specifications
- Participation in European efforts
- What’s up with FHIR
- The observation code and the NPU terminology

A brief history

- 0 AD – Edifact
- 2009 – NPÖ (the “Swedish patient summary”) operative, Inera AB
  - Initially “clinical chemistry” results only
- 2018 – New specification (v4.0) supporting complex results in development
- 2019 – New specification implemented in 1 region
- 2020 – Covid-19
- 2025 – New guidance documentation, lab-to-lab communication

- Developed together with the laboratories

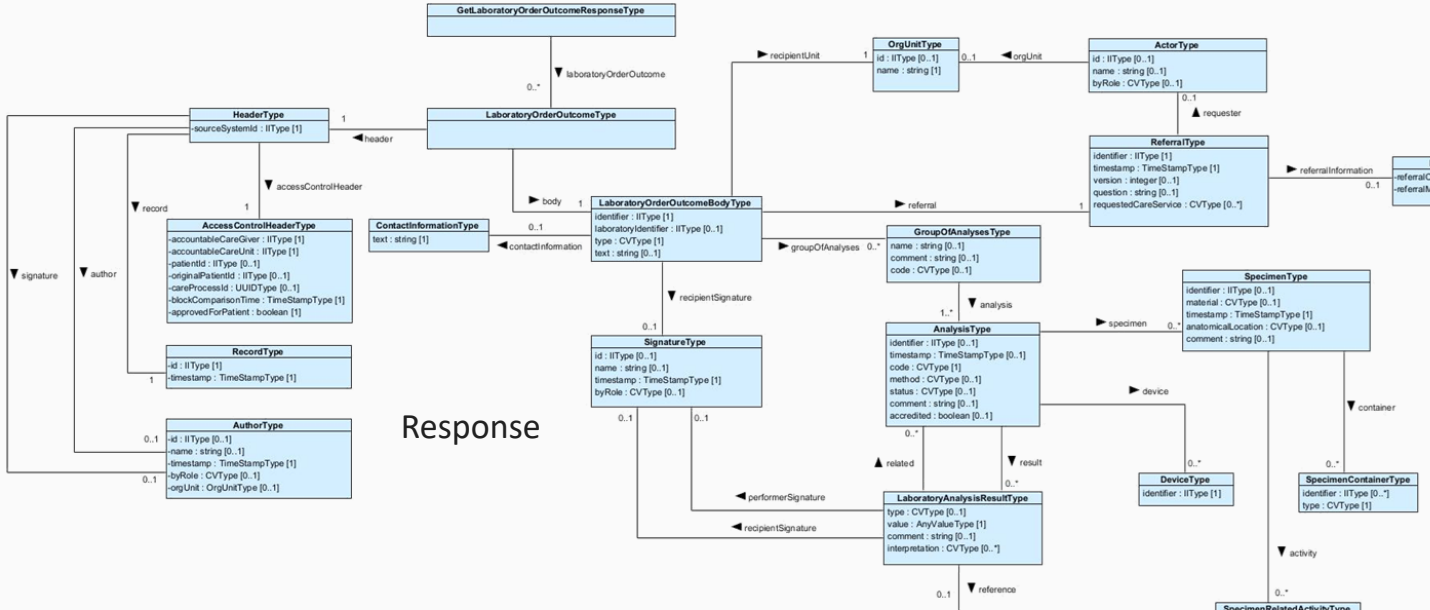
Laboratory specification v4

- Developed as a national specification mapped to a national RIM
- Main use case microbiology and antibiograms – i.e. complex results

Request

GetLaboratoryOrderOutcomeType
careUnitHSAId : IIType [0..*]
careGiverHSAId : IIType [0..*]
patientId : IIType [1]
datePeriod : DatePeriodType [0..1]
sourceSystemHSAId : IIType [0..1]
specimenIdentifier : IIType [0..*]
referralIdentifier : IIType [0..*]
laboratoryIdentifier : IIType [0..*]

Response



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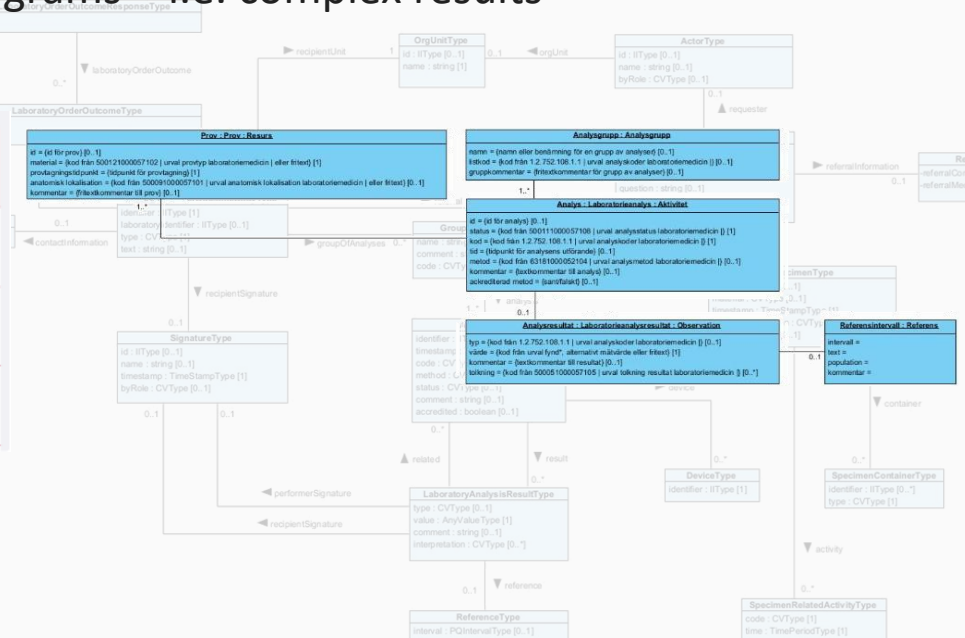
Laboratory specification v4

- Developed as a national specification mapped to a national RIM
- Main use case microbiology and antibiograms – i.e. complex results

Analys	Resultat och kommentarer * markerar resultat utanför referensintervallet	
B—Hemoglobin (Hb) Referensintervall: 117-153	**154 g/L *** Vidimerat: Gustav Welander 2018-06-15	Graf
B—Neutrofila granulocyter Referensintervall: 1.7-8	**4.7 x10E9/L** Vidimerat: Gustav Welander 2018-06-15	Graf
B—Leukocyter Referensintervall: 3.5-8.8	**7.9 x10E9/L** Vidimerat: Gustav Welander 2018-06-15	Graf



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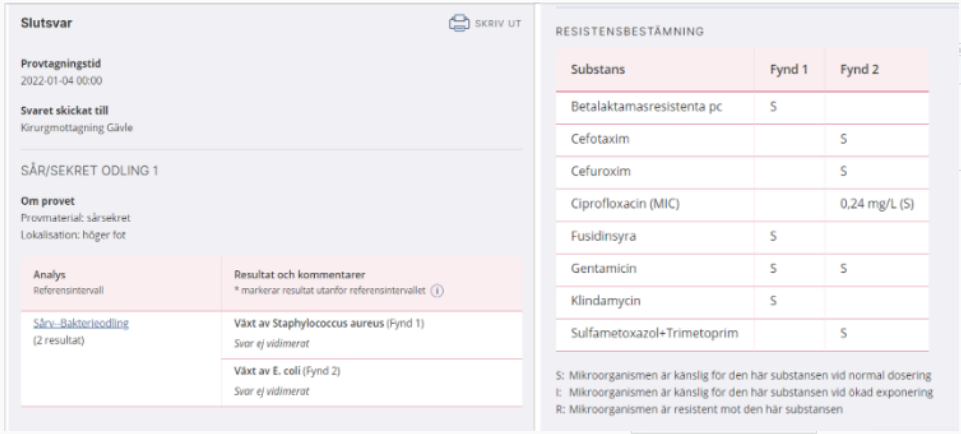

Slutsvar

SKRIV UT

Provtagningstid
2022-01-04 00:00

Svaret skickat till
Kirurgmottagning Gävle

SÅR/SEKRET ODLING 1

Om provet
Provmaterial: sårsekret
Lokalisation: höger fot

Analys Referensintervall	Resultat och kommentarer * markerar resultat utanför referensintervallet
Sårv.-Bakterieodling (2 resultat)	**Växt av Staphylococcus aureus** (Fynd 1) *Svar ej vidimerat*
	Växt av E. coli (Fynd 2) *Svar ej vidimerat*

RESISTENSBESTÄMNING

Substans	Fynd 1	Fynd 2
Betalaktamasresistenta pc	S	
Cefotaxim		S
Cefuroxim		S
Ciprofloxacin (MIC)		0,24 mg/L (S)
Fusidinsyra	S	
Gentamicin	S	S
Klindamycin	S	
Sulfametoxazol+Trimetoprim		S

S: Mikroorganismen är känslig för den här substansen vid normal dosering
I: Mikroorganismen är känslig för den här substansen vid ökad exponering
R: Mikroorganismen är resistent mot den här substansen

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European projects

- Sweden participated in the X-eHealth project's laboratory task
  - Contribution of experiences from the laboratory services implementation, including value sets for laboratory orders and results.
- Continues in eX-eHealth through HL7 Europe and Xt-EHR

Xt EHR @dataspace

HL7 Europe

119371008	abscess
122552005	artärblod
119295008	aspirat
430268003	benbit
119359002	benmärg
430238007	bihålesekret
258415003	biopsi
119297000	blod
258482009	blåssekret
258446004	bronksekret
309176002	bronkiellt borstprov
258607008	BAL-vätska
122609004	bronksköljvätska
119328004	bröstmjölk
258587000	buffy coat
309201001	bukvätska
258448003	bursavätska
258450006	cerebrospinalvätska
258451005	cervixsekret
57931000052101	cervixsektret i urin
258499005	cough swab
472929000	CVK-spets
119360007	dialysvätska
258566005	DNA
440500007	dry blod spot
1003705007	dränagespets
258455001	dränagevätska
119351004	erytrocyter
119339001	feces
309502007	foster
119373006	fostervatten
447103002	främmande kropp
119341000	galla
258438000	glaskropp
258580003	helblod
57921000052103	helblod, EDTA
258485006	hornhinna, skrapprov
446952006	hudskrap
258503004	hudyta
119326000	hår
732976006	hörselgång
119303007	isolat
258444001	kammarvätska
122554006	kapillärblod
119312009	kateterspets
440473005	kontaktlins
122572000	kräkning
431361003	ledvätska

HL7 EU FHIR Laboratory IG

- Currently HL7 FHIR is not in routine use for laboratory
- HL7 Sweden working group on Laboratory and HL7 FHIR
  - Region Skåne, Västra Götaland for historic results from legacy systems using the HL7 EU FHIR IG
  - Issues found are reported to HL7 Europe
- HL7 FHIR and Inera AB laboratory services

inera

  - Logical mapping to HL7 EU specification to assess compatibility, EHDS requirement
  - Future: Technical mapping to allow HL7 FHIR to be used alongside current specification

Credit

- Rebecca Ceder, Inera AB
- Oskar Thunman, Inera AB
- Mats Olofsson, Region Skåne
- Rasmus Bergfors, Region Skåne

eHälsomyndigheten

EHDS Logical Information Models
0.1.0 - ci-build

Home | Introduction | EHDS Use Cases | About | Artifacts | Download

Table of Contents > **Artifacts Summary** > **Laboratory observation model**

EHDS Logical Information Models, published by Xt-EHR. This guide is not an authorized publication; it is the continuous build for version 0.1.0 built by the FHIR (HL7® FHIR® Standard) CI Build. This version is based on the current content of https://github.com/Xt-EHR/xt-ehr-common/ and changes regularly. See the Directory of published versions

Content | Detailed Descriptions | Mappings | XML | JSON | TTL

13.41.1 Logical Model: Laboratory observation model

Official URL: `https://www.xt-ehr.eu/specifications/fhir/StructureDefinition/EHDSLaboratoryObservation`	*Version*: `0.1.0`
Draft as of 2025-03-12	*Computable Name*: `EHDSLaboratoryObservation`

C.11 - EHDS refined base model for Observation performed by laboratory

Usage:

- Use this Logical Model Profile: Laboratory observation model, Laboratory report body model, Observation model and Patient summary body model
- Refer to this Logical Model Profile: Appointment model

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13.41.1.1 Formal Views of Profile Content

Description of Profiles, Differentials, Snapshots and how the different presentations work.

Key Elements Table | Differential Table | Snapshot Table | Statistics/References | All

Name	Flags	Card.	Type	Description & Constraints
EHDSLaboratoryObservation		0..*	EHDSObservation	
observationDate[x]		1..1		C.10.1 - Observation date
observationDateDateTime			dateTime	
observationDatePeriod			Period	
observationCode		1..1	CodeableConcept	C.10.2 - Observation code **Binding Description (No ValueSet):** (preferred): LOINC, NPU
observationName		1..1	string	C.10.3 - Observation name
observationOriginalName		0..1	string	C.10.4 - Observation original name
observationMethod		0..1	CodeableConcept	C.10.5 - Observation method **Binding Description (No ValueSet):** (preferred): SNOMED CT

Used in many other countries

Used mainly in Denmark, Norway and Sweden

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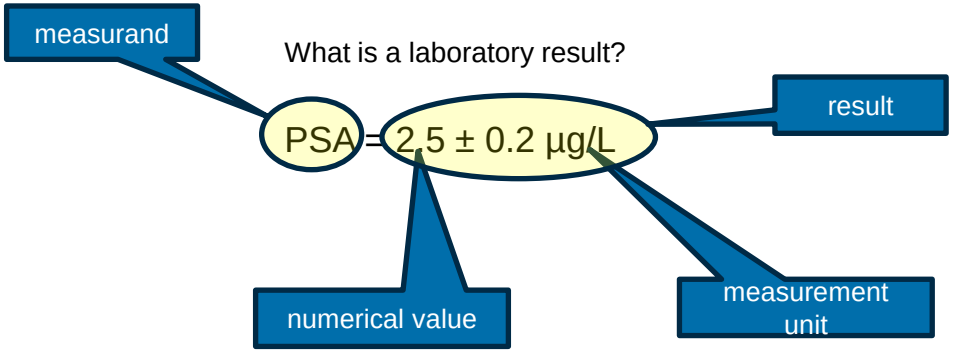
The observation code



The measurand is the ”quantity intended to be measured”

What is observed

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The observation code

Two different coding systems for measurands – LOINC and NPU

Both terminologies are based on the same principle:

Measurands are described by three major axes;

system, component, and kind-of-property

The LOINC system allows **different units** for each measurand and LOINC code

The NPU system precoordinates the **measurement unit** in the NPU code

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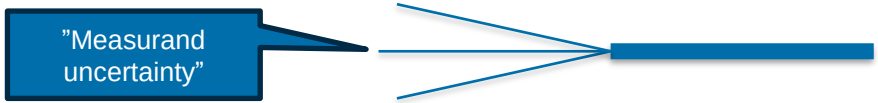
The observation code

PSA = 5.0 µg/L ± 0.5 µg/L

Different standardizations used for the same measurand

PSA (IS 96/170)
PSA (IS 17/100) = 5.0 µg/L ± µg/L 0.5 µg/L
PSA (Hybritech)



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Supporting information as metadata for how the observation is made

Specimen type
Tube
Anatomical location
Method
Equipment

Calibration
Patient condition
Test name (procedure)
…..
…..

To reduce ”measurand uncetainty” some metadata are pre-coordinated in the LOINC codes while other metadata are pre-coordinated in the NPU codes.

This is the main difference between the LOINC and NPU coding systems!

Xt-EHR treats metadata as supporting information, to be post-coordinated with Snomed CT.

Both LOINC and NPU-terminologies will be incorporated in the Snomed CT platform.

Further mapping possibilities to be explored.

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Thank you

Daniel Karlsson (SeHA), Gunnar Nordin (Equalis AB)

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HL7 Sweden

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Jean-Michel Polfliet

Head of Standardization Team @ eHealth Platform

Belgian Public Institution

HL7-be Co-chair

DIGIRELAB - Project Facilitator

FHIR Labo Result in the Belgian ecosystem

13-03-25

Giorgio Cangioli

- Co-facilitator of the HL7 EU Laboratory Report FHIR IG
- eHMSEG STF Architecture WG chair
- xShare Tech Specs WP leader
- Technical Lead, Board member HL7 Europe
- Board, TSC, AEC member at HL7 International

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Next steps

- Slides and recording on www.HL7.tv, notification to all registered attendees

- Join HL7 at the next WGM in Madrid, 10-16 May 2025 https://info.hl7.org/may-2025-wgm

Thank you !