

# New concept proposal

## Lab Test Event

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<b>Project</b>	General importance	<b>Contact person</b>	DCC
<b>Dataset release</b>	2024.1	<b>Consulted expert</b>	

### 1 Rationale

The new concept Lab Test Event enables representing and connecting a series of lab tests performed on a sample and the outcome (result) for each of these tests. Following the knowledge-oriented guiding principles defined in SPHN, the Lab Test Event has as input a Sample and has output a set of Lab Tests which describe the Results obtained for each test performed on that sample.

The concept is extended and now designed for enabling reuse in specific laboratory contexts, such as microbiology. The Lab Test Event concept can be instantiated, or used as a parent concept for specific test procedure concepts which further specify the semantic standard, value set or subset. Such specific lab test event concepts would be for example, Microorganism Identification Test Event, Microbiology Resistance Test Event, and Microbiology Microscopy Test Event.

With this representation, the focus is put onto the subject (here, a sample) being processed in different lab tests, as done in other concepts such as measurements, diagnosis, etc., where the subject is commonly the subject pseudo identifier.

Visual graphic of concepts for encoding a Lab Test Event

### 2 Comparison to other standards/data models

#### 2.1 UMLS

In UMLS, the NCI provides a definition for the Event as a “Something that happens at a given place and time.”

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### 3 Concept information

Concept or concept compositions or inherited	General concept name	General description	Contextualized concept name	Contextualized description	Type	Standard	Value set or subset	Meaning binding	cardinality for composedOf
concept	Lab Test Event	combined set of lab tests performed on a biological specimen at a given place and time in a controlled laboratory environment	Lab Test Event	combine set of lab tests performed on a biological specimen at a given place and time in a controlled laboratory environment					
composedOf	sample	sample associated to the concept	sample	sample tested during the lab test event	Sample				0:1
composedOf	lab test	lab test associated to the concept	lab test	type of analysis performed on a sample and its result, including an identifier for the test, the instrument and the test kit in the context of the lab test event	Lab Test				1:n
composedOf	datetime	datetime of the concept	event datetime	datetime when the lab test event (analysis) was performed	temporal				0:1
composedOf	report datetime	datetime the concept was reported	lab report datetime	datetime the lab test event and its related tests and results have been reported	temporal				0:1

General concept name	cardinality for concept to Administrative Case	cardinality for concept to Data Provider	cardinality for Subject Pseudo Identifier	cardinality for Source System
Lab Test Event	0:1	1:1	1:1	1:1

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## 4 Impact on the SPHN Dataset

The new Lab Test Event concept has an influence on the existing Lab Result and the Lab Test concepts which are subject of adaptation.

The Lab Test Event covers the current lack of information about the datetime when the procedure was performed and when the report of that procedure was generated (which is important for microbiology test procedures).

The Lab Result is deprecated. The Lab Test is a composedOf of the Lab Test Event.

## 5 Discussion

The Lab Test Event concept is intended for representing laboratory procedures and analysis done on a sample (specimen) with one or multiple tests. The tests performed with patients, such as cognitive tests for patients with Alzheimer's disease, are not within the scope of this concept. High-throughput data are also not in the scope of this concept but would be covered in the omics concepts.

The restrictions on standard for representing Lab Test or Sample will only apply for specific variants of Lab Test Events (e.g. Microbiology Resistance Test Event or Microbiology Microscopy Test Event).

Note that the sample is optional to cover cases where lab data would be available without any information about the sample. It can be used to reflect cases where, for instance, only a result and a datetime of a lab test event would be available.

While these changes to lab concepts are not exactly minor, they will ensure a more generic approach which allows a versatile and natural representation of laboratory results of various kinds of analyses, ranging from clinical chemistry and microbiology to routine clinical laboratory tests.

Note that the order number was not retained in the Lab Test Event since there has not been any need by the projects to have this information. Since the order number is also sensitive information, this reduces the necessary workload to identify such data. The mention of an identifier was also discussed and proposed but was not retained either since there was no conclusion on how such information would be useful for research purposes and how this would differ from an order number.

## 6 Example

### Lab Test Event

datetime: 2016-01-15


report datetime: 2016-01-20

sample:

identifier: 123456471142

body site: 66480008 |Structure of left forearm (body structure)

material type: 50863008 |Plasma (substance)

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fixation type: -  
collection datetime: 2016-01-15  
primary container: Lithium heparin and gel

lab test:

code: LOINC:2951-2 |Sodium [Moles/volume] in Serum or Plasma|  
instrument: 04015630930845 |cobas 8000 c 702 Module|  
test kit: 08430215011546 |Sodium Electrode|  
result:

quantity:  
value: 135.0  
unit: mmol/L

code: -  
string value: -