

Change request

Allergy Episode

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Project	general interest	Contact	DCC
Dataset release	2024.1	Consulted expert	

1 Change request input / rationale

The current concept Allergy Episode (release 2023.2) features several composedOf-names starting with the term “exposure”. These properties should be combined in a separate concept “Exposure” for semantic consistency. Moreover, the concept features several attribute names starting with the term “manifestation” which is already covered in the general description of the concept.

Proposed changes:

- removal of all composedOfs related to exposure (exposure datetime, exposure duration, and exposure route code) in favor of a single composedOf “exposure” of type “[Exposure](#)” (new concept to be created)
- removal of “manifestation” from all composedOf-names apart from “manifestation code”.

These measures improve semantic consistency of the SPHN ontology.

2 Comparison to other standards/data models

2.1 SNOMED CT

SNOMED CT uses the code [473011001](#) | Allergic condition (finding) | to represent various disorders or findings related to allergies, for example Allergic disorder (disorder), Allergic disposition (finding), Allergic sensitization (finding), or Allergic reaction (disorder). These terms, however, do not describe the episode or manifestation of the allergy.

2.2 NCIT

The NCIT defines “Allergic Reaction” (Code [C114476](#)) as “An immune response that occurs following re-exposure to an innocuous antigen, and that requires the presence of existing antibodies against that antigen. This response involves the binding of IgE to mast cells, and may worsen with repeated exposures.”. More concisely, the CTCAE definition of “Allergic Reaction” is “A disorder characterized by an adverse local or general response from exposure to an allergen.”. The NICHHD Definition is “A hypersensitivity reaction triggered by exposure to a previously encountered foreign substance to which the individual has formed antibodies.”

The term “Episode” is defined as “A noteworthy happening that is distinctive in a series of related events.” ([NCIT:C75539](#)).

Both the character of “exposure” and the actual manifestation (“episode”) are represented in the SPHN concept “Allergy Episode”.

3 Change content

3.1 Currently released concept

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	Allergy Episode	manifestation of an allergic reaction following an exposure to an allergen	Allergy Episode	manifestation of an allergic reaction following an exposure to an allergen					
composedOf	allergen	any substance, product or physical force producing immediate hypersensitivity responsible for the concept	allergen	any substance, product or physical force producing immediate hypersensitivity	Allergen				1:1
composedOf	certainty code	code, name, coding system and version describing the degree of certainty (from a clinical point of view) that the specific substance triggered the concept	certainty	degree of certainty (from a clinical point of view) that the specific substance triggered the event	Code	SNOMED CT	415684004 Suspected (qualifier value) ; 410592001 Probably present (qualifier value) ; 410605003 Confirmed present (qualifier value)		0:1

composedOf	manifestation code	code, name, coding system and version describing the clinical symptom and/or sign that occurred during the specific concept	manifestation	clinical symptom and/or sign that occurred during the specific episode	Code	SNOMED CT	descendant of: 404684003 [Clinical finding (finding)]		0:1
composedOf	manifestation datetime	datetime when manifestation showed	manifestation datetime	datetime when manifestation showed	temporal				0:1
composedOf	manifestation duration	duration of manifestation	manifestation duration	duration of manifestation	Quantity				0:1
composedOf	manifestation severity code	code, name, coding system and version describing the severity of the manifestation	manifestation severity	severity of the manifestation	Code	SNOMED CT	255604002 Mild (qualifier value) ; 6736007 Moderate (severity modifier) (qualifier value) ; 24484000 Severe (severity modifier) (qualifier value)		0:1
composedOf	manifestation body site	location in the body where the manifestation occurs (also referred to as manifestation location)	manifestation body site	location in the body where the manifestation occurs (also referred to as manifestation location)	Body Site				0:1
composedOf	exposure datetime	datetime of exposure	exposure datetime	datetime of exposure to the substance which led to the allergy episode	temporal				0:1

composedOf	exposure duration	duration of the exposure	exposure duration	duration of the exposure to the substance which led to the allergy episode	Quantity				0:1
composedOf	exposure route code	code, name, coding system and version describing how the individual was exposed to the substance	exposure route	how the individual was exposed to the substance	Code	SNOMED CT	descendant of: 284009009 Route of administration value (qualifier value)		0:1

General concept name	Cardinality for concept to Administrative Case	Cardinality for concept to Data Provider Institute	Cardinality for concept to Subject Pseudo Identifier
Allergy Episode	0:1	1:1	1:1

3.2 Proposed new concept

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	Allergy Episode	manifestation of an allergic reaction following an exposure to an allergen	Allergy Episode	manifestation of an allergic reaction following an exposure to an allergen					
composedOf	allergen	any substance, product or physical force producing immediate hypersensitivity responsible for the concept	allergen	any substance, product or physical force producing immediate hypersensitivity	Allergen				1:1
composedOf	certainty code	coded information specifying the degree of certainty associated to the concept	certainty	degree of certainty (from a clinical point of view) that the specific substance triggered the event	Code	SNOMED CT	415684004 Suspected (qualifier value) ; 410592001 Probably present (qualifier value) ; 410605003 Confirmed present (qualifier value)		0:1
composedOf	manifestation code	coded information specifying the clinical symptom and/or sign that occurred during the specific concept	manifestation	clinical symptom and/or sign that occurred during the specific episode	Code	SNOMED CT	descendant of: 404684003 Clinical finding (finding)		0:1

composedOf	datetime	datetime of the concept	datetime	datetime when the allergy manifestation occurred	temporal				0:1
composedOf	duration	elapsed time from start to end of the concept	duration	duration of the allergy episode	Quantity				0:1
composedOf	severity code	coded information specifying the severity of the concept	severity	severity of the allergy episode	Code	SNOMED CT	255604002 Mild (qualifier value) ; 6736007 Moderate (severity modifier) (qualifier value) ; 24484000 Severe (severity modifier) (qualifier value)		0:1
composedOf	body site	anatomical site or structure associated to the concept	body site	location in the body where the allergy manifestation occurs (also referred to as manifestation location)	Body Site				0:1
composedOf	exposure	exposure associated to the concept	exposure	exposure associated to the allergy episode	Exposure				0:1

General concept name	Cardinality for concept to Administrative Case	Cardinality for concept to Data Provider	Cardinality for concept to Subject Pseudo Identifier	Cardinality for concept to Source System
Allergy Episode	0:1	1:1	1:1	1:1

4 Pros and cons

4.1 Advantages

The proposed changes improve semantic consistency of the SPHN ontology. The separate concept [Exposure](#) can be reused in other contexts, e.g., Tobacco Exposure (release 2024.1).

4.2 Disadvantages

The composedOf 'agent code' of the 'Exposure' concept ([Figure 1](#) below, right part) underlying the composedOf 'exposure' may potentially lead to conflicts with the composedOf 'allergen'. 'agent code' (cardinality 0:1) should therefore not be instantiated in the context of 'Allergy Episode'.

5 Impact on SPHN Dataset

The changes to Allergy Episode described here require the creation of a new concept [Exposure](#) which will be part of release 2024.1.

6 Discussion

Changes to the concept Allergy Episode combine attributes describing the same entity in the concept Exposure. Moreover, superfluous parts of attribute names are removed as they are already covered in the general description of the concept (removal of "manifestation" from all composedOf-names apart from "manifestation code").

These measures improve semantic consistency of the SPHN ontology.

Usage guidelines:

- **composedOf 'allergen':** One and only one instance of 'allergen' of Type 'Allergen' is required and allowed (cardinality 1:1). Note that the concept 'Allergen' features a cardinality of 1:n for its 'code'-composedOf specifying the allergen ([Figure 1](#) below, left part). This does, however, **NOT** mean that **multiple codes for different allergens** are allowed! **Instead**, it offers the option to represent the **same allergen with codes of different coding systems** (SNOMED CT, ATC, and/or GTIN).
- **composedOf 'exposure':** The composedOf 'agent code' (cardinality 0:1) of the Exposure concept ([Figure 1](#) below, right part) **should not be instantiated** in the context of the **composedOf 'exposure'** of Allergy Episode' to avoid conflicts with the composedOf 'allergen' (see above; compare Example below).

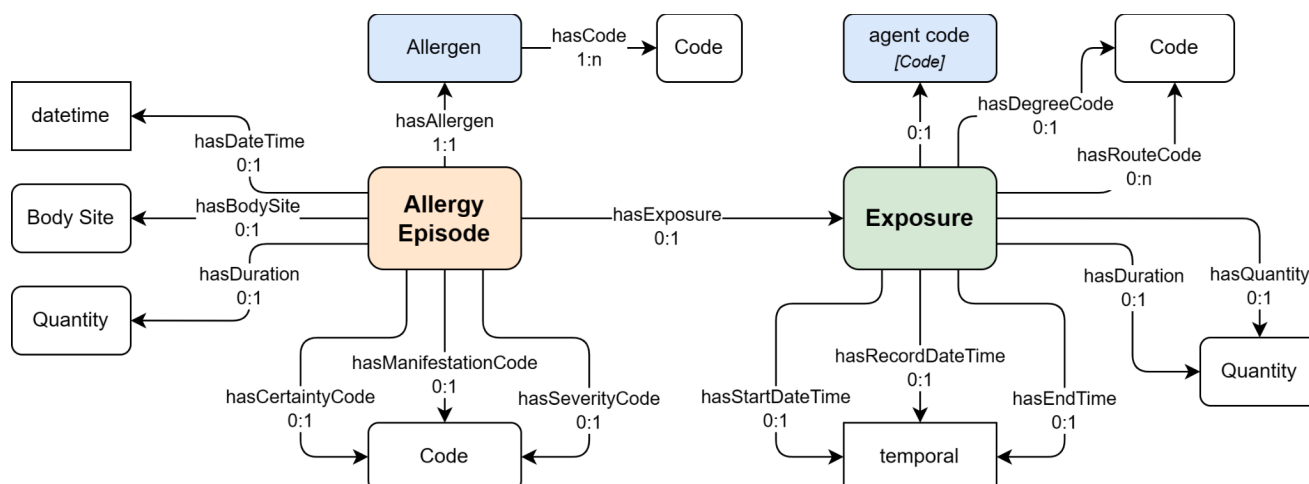


Figure 1: Relationship of Allergy Episode and Exposure.

Note that the composedOf 'agent code' of Exposure is shown separately from the other composedOfs of type 'Code' of Exposure (degree code, route code) for better accessibility. **The composedOf 'agent code' (cardinality 0:1) of Exposure should not be instantiated in the context of 'Allergy Episode'.**

7 Example

Allergy Episode

allergen:

identifier: 698724007

name: Ambrosia psilostachya pollen (substance)

coding system and version: SNOMED-CT-2023-07-31

certainty code:

identifier: 410592001

name: Probably present (qualifier value)

coding system and version: SNOMED-CT-2023-07-31

manifestation code:

identifier: 386813002

name: Abnormal breathing (finding)

coding system and version: SNOMED-CT-2023-07-31

datetime: 2022-08-02 11:15:23

duration:

quantity:

value: 2.5

unit:

code:

identifier: h

name: h

coding system and version: **SNOMED-CT-2023-07-31**
 comparator: -

severity code:
 identifier: **6736007**
 name: **Moderate (severity modifier) (qualifier value)**
 coding system and version: **SNOMED-CT-2023-07-31**

body site:
 code:
 identifier: **39607008**
 name: **Lung structure (body structure)**
 coding system and version: **SNOMED-CT-2023-07-31**
 laterality: -

exposure:
 agent code: - *[Note: 'agent code' is not to be instantiated in the context of 'Allergy Episode'.]*
 degree code:
 identifier: **62482003**
 name: **Low (qualifier value)**
 coding system and version: **SNOMED-CT-2023-07-31**
 quantity: -
 route code:
 identifier: **284009009**
 name: **Respiratory tract route (qualifier value)**
 coding system and version: **SNOMED-CT-2023-07-31**
 start datetime: -
 end datetime: -
 duration:
 quantity:
 value: **0.5**
 unit:
 code:
 identifier: **h**
 name: **h**
 coding system and version: **SNOMED-CT-2023-07-31**
 record datetime: **2022-08-02 12:23:42**