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cantionali della sanità

eHealth Suisse

eVaccination CH-VACD

Documentation about the FHIR standard

Bern, 27.10.2022

Introduction

This document is addressed to developers and implementers who want to implement the exchange format CH-VACD (eImpfdossier). The exchange format eImpfdossier describes the FHIR representation of the defined documents for the exchange of vaccination and immunization information. The documents are based on the IHE Technical Framework "Patient Care Coordination (Pcc)" with the profile "Immunization Content (IC)". In this document, the "Immunization Administration document" and "Vaccination Record document" are addressed. This documentation is intended as a simplification and explains how an FHIR implementation guide is structured and how an implementation guide can be read and interpreted. Furthermore, the document simplifies the minimum requirements of the exchange format, which are set out in the Regulation in Annex 4. The complete FHIR implementation guide can be found at <http://fhir.ch/ig/ch-vacd/index.html>.

Introduction to FHIR Implementation Guide

An implementation guide (IG) is a set of rules about how FHIR resources are used to solve a particular problem, with associated documentation to support and clarify the usage. They are intended to serve as an aid before and during the development of software or derived profiles.

In FHIR, health care data is broken down into categories such as patients, laboratory results, and medication. Each of these categories is represented by a FHIR Resource, which defines the component data elements, constraints on data, and data relationships that together make up an exchangeable patient record.

Example Resource from Patient:

```

<Patient xmlns="http://hl7.org/fhir">
  <id value="glossy"/>
  <meta>
    <lastUpdated value="2014-11-13T11:41:00+11:00"/>
  </meta>
  <text>
    <status value="generated"/>
    <div xmlns="http://www.w3.org/1999/xhtml">
      <p>Henry Levin the 7th</p>
      <p>MRN: 123456. Male, 24-Sept 1932</p>
    </div>
  </text>
  <extension url="http://example.org/StructureDefinition/trials">
    <valueCode value="renal"/>
  </extension>
  <identifier>
    <use value="usual"/>
    <type>
      <coding>
        <system value="http://hl7.org/fhir/v2/0203"/>
        <code value="MR"/>
      </coding>
    </type>
    <system value="http://www.goodhealth.org/identifiers/mrn"/>
    <value value="123456"/>
  </identifier>
  <active value="true"/>
  <name>
    <family value="Levin"/>
    <given value="Henry"/>
    <suffix value="The 7th"/>
  </name>
  <gender value="male"/>
  <birthDate value="1932-09-24"/>
  <careProvider>
    <reference value="Organization/2"/>
    <display value="Good Health Clinic"/>
  </careProvider>
</Patient>

```

Resource Identity & Metadata

Human Readable Summary

Extension with URL to definition

Standard Data:

- MRN
- Name
- Gender
- Birth Date
- Provider


A typical FHIR resource in an Implementation Guide is structured as shown in the example below:


Name	Flags	Card.	Type	Description & Constraints
Resource Name			Base Type	Definition
nameA	Σ	1..1	TypeA	description of content
nameB[x]	?! Σ	0..1		description SHALL at least have a value
nameBType1		0..1	TypeB	
nameBType2	I	0..1	typeC	
nameC		1..*	BackboneElement	Definition
nameD		1..1	TypeD	Relevant Records


The FHIR resource is defined as a tree structure with the following columns:


Column	Content
Name	The name of the element in the resource. Some names finish with [x]. Dies bedeutet, dass das Element die Wahl zwischen mehr als einem Datentyp haben für den Inhalt. In addition, this column contains an icon that denotes the underlying type of the content. The icons are described below
Flags	A set of information about the element that impacts how implementers handle them. The flags are described below
Card.	Cardinality: the lower and upper bounds on how many times this element is allowed to appear in the resource
Type	The type of the element (hyperlinked to the definition of the type).
Description & Constraints	A description of the element, and details about constraints that are applied to it. Particularly, for coded elements, information about which codes can be used.


Meaning of the icons


: The base element for a resource (see Resources)


: An element that is part of the resource and has elements within it defined in the same resource or profile


: An element which can have one of several different types


: An element of a data type which describes an element that has a value attribute/property. These are also known as primitive types. All primitive type names start with a lower case letter


: An element of a data type which describes an element that has other elements. These are known as complex types. All complex type names defined in this specification start with an upper case letter


: An element that contains a reference to another resource (see references)


: This element has the same content as another element defined within this resource or profile


: Introduction of a set of slices (see Slicing)

: A complex extension - one with nested extensions (see Extensibility)

: An extension that has a value and no nested extensions (see Extensibility)

: A complex modifier extension - one with nested extensions (see Extensibility)

: A modifier extension that has a value and no nested extensions (see Extensibility)

: The root of a logical profile

Meaning of the flags

?!: This element is a modifying element

S: This element is an element that must be supported

Σ: This element is an element that is part of the summary set

I: This element defines or is affected by constraints

NE: This element cannot have extensions

TU: This element has a standards status of Trial Use

N: This element has a standards status of Normative

D: This element has a standards status of Draft

Must Support flag

Labeling an element MustSupport means that implementations that produce or consume resources SHALL provide «support» for the element in some meaningful way. The purpose of Must Support is for use in situations such as national program created profiles where they want to leave an element as «optional», but want to state that implementers must support that element

Slicing

Slicing is used for elements that can occur more than once (e.g. in a list). The list can be divided into a number of sublists, each with different constraints on the elements in the sublist with the associated

additional meaning. This process can also be used for elements that do not repeat but have a choice of data types.

References

References refer to elements in another resource. With the help of these references, resources are combined to build a network of information. References are always defined and represented in one direction - from one resource (source) to another (destination). Because resources are processed independently, relationships are not considered transitive.

Extensibility

Every resource or data type element may include one or more "extension" child elements. The extension is either simple or complex. Simple extensions have only a value and no nested extensions. Complex extensions contain one or more nested extensions and no value. An extension can not have both a value and nested extensions.

There are some cases where the information provided in an extension modifies the meaning of the element that contains it. Typically, this means information that qualifies or negates the primary meaning of the element that contains it. Example A flag on a [Patient.contact] indicating they are not to be contacted.

Immunization Administration document

The Immunization Administration document describes the content and format of an immunization administration document. It serves to document changes in the immunization status and contains information on applied immunizations and further relevant chapters as medical and exposition risks or serology results.

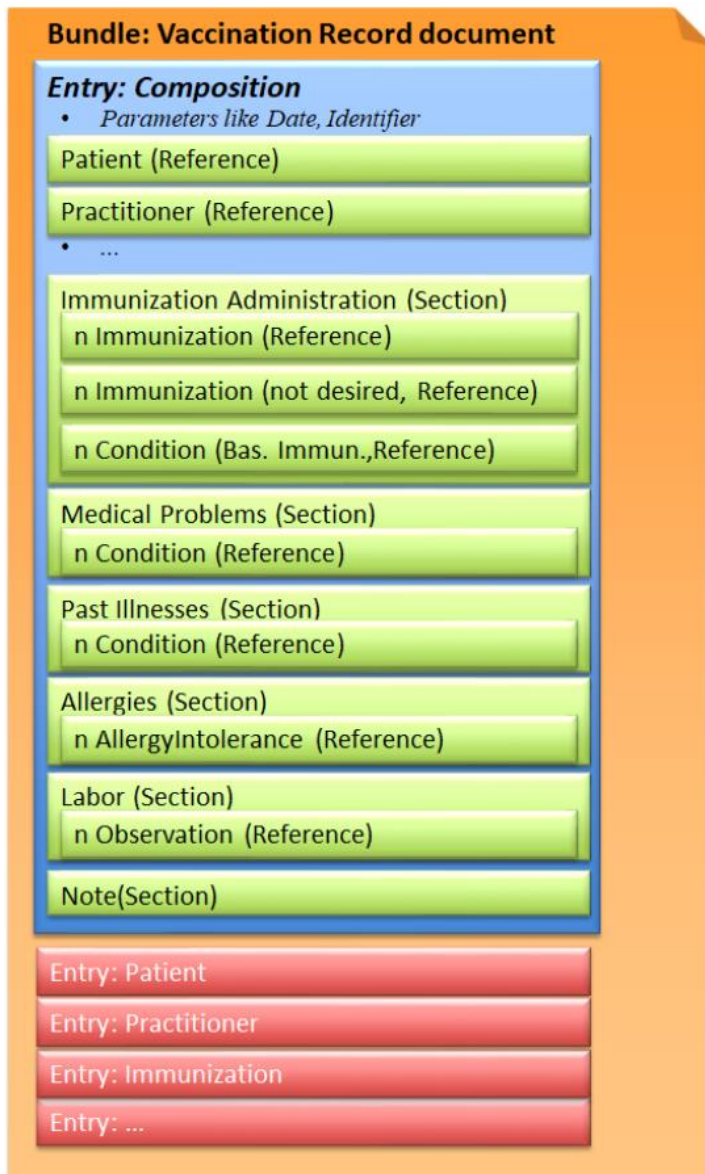
This document is allowed to be used in context of the Swiss EPR but can also be used in context of data exchange next to the Swiss EPR.



Vaccination Record document

The Vaccination Record document describes the content and format of a vaccination record document. It is a compilation of all available immunization-related content and thus shows the patient's immunization status at a specific point in time. The vaccination dossier contains the entries from the vaccination documentation, i.e. information on applied immunizations and further relevant chapters as medical and exposition risks or serology results.

This document is allowed to be used in context of the Swiss EPR but can also be used in context of data exchange next to the Swiss EPR.





Immunization

Name	Path in exchange format	Type	Cardinality	Description	Example
Vaccine administration date	Immunization.occurrence[x]:occurrenceDateTime	dateTime	0..1	Date vaccine administered or was to be administered	"occurrenceDateTime" : "2017-09-15T09:12:56+02:00"
Dose number	Immunization.protocolApplied.doseNumber[x]	positiveInt	1..1	Dose number within series	"doseNumberPositiveInt" : 1
Extension «ch-vacd-ext-cross-reference» bzw. Attribut «relatesTo»	Immunization.extension:relatesTo	Extension	0..*	The definition of a relation of this immunization entry in this document to an immunization entry in an other document	"extension" : [<pre> { "url" : "entry", "valueReference" : { "reference" : "Immunization/TCA03-IMMUN5-patient" } }, { "url" : "document", "valueReference" : { "reference" : "Composition/A-D5-P-C1-Composition" } }, { "url" : "relationcode", "valueCode" : "replaces" }] "url" : "http://fhir.ch/ig/ch-vacd/StructureDefinition/ch-vacd-ext-cross-reference" } </pre>
Name of the health professional	Immunization.performer	BackboneElement	0..*	Indicates who performed the immunization event.	"performer" : [<pre> { "actor" : { "reference" : "PractitionerRole/6-6-PractitionerRole" } } </pre>

					<pre> }], </pre>
Reason for vaccination	Immunization.reasonCode Value Set: ImmunizationReasonCodes	CodeableConcept	0..*	Reasons why the vaccine was administered.	<pre> "reasonCode" : [{ "coding" : [{ "system" : "http://terminology.hl7.org/CodeSystem/v3-ActCode", "code" : "IMMUNIZ", "display" : "Immunization" }] }]], </pre>
vaccination protection	Immunization.protocolApplied.targetDisease Value Set: Target disease and illnesses undergone for immunization	CodeableConcept	1..*	Vaccine preventable disease being targeted	<pre> "targetDisease" : [{ "coding" : [{ "system" : "http://snomed.info/sct", "code" : "397430003", "display" : "Diphtheria caused by Corynebacterium diphtheriae (disorder)" }] }]], </pre>
Lotnumber	Immunization.lotNumber	string	0..1	Lot number of the vaccine product.	<pre> "lotNumber" : "12-34244" </pre>
Vaccine	Immunization.vaccineCode Value Set: Swissmedic code for vaccine code	CodeableConcept	1..1	Vaccine that was administered or was to be administered.	<pre> "vaccineCode" : { "coding" : [{ "system" : "http://fhir.ch/ig/ch-vacd/CodeSystem/ch-vacd-swissmedic-cs", "code" : "268", "display" : "MMR-II" }] }], </pre>
Immunization status	Immunization.status Value Set: ImmunizationStatusCodes	code	1..1	Indicates the current status of the immunization event.	<pre> "status" : "completed", </pre>
Note	Immunization.note	Annotation	0..*	Extra information about the immunization that is not conveyed by the other attributes.	<pre> "note" : [{ "text" : "Prick-Test positiv" }]], </pre>

Past Illness

Name	Path in exchange format	Type	Cardinality	Description	Example
End time of the disease	Condition.abatement[x]	dateTime	0..1	The date or estimated date that the condition resolved or went into remission.	"abatementDateTime" : "2021-09-10",
Extension «ch-vacd-ext-cross-reference» bzw. Attribut «relatesTo»,	Condition.extension:relatesTo	Extension	0..1	The definition of a relation of this immunization entry in this document to an immunization entry in an other document.	"extension" : [<pre> { "extension" : [{ "url" : "entry", "valueReference" : { "reference" : "Condition/TCC05-UNDILL1" } }, { "url" : "document", "valueReference" : { "reference" : "Composition/C-D6-P-C1-Composition" } }, { "url" : "relationcode", "valueCode" : "replaces" }], "url" : "http://fhir.ch/ig/ch-vacd/StructureDefinition/ch-vacd-ext-cross-reference" }],</pre>
Clinical status	Condition.clinicalStatus Value Set: ConditionClinicalStatusCodes	CodeableConcept	1..1	The clinical status of the condition.	"clinicalStatus" : { <pre> "coding" : [{ "system" : "http://terminology.hl7.org/CodeSystem/condition-clinical", "code" : "resolved", "display" : "Resolved" }] }</pre>

Disease	Condition.code Value Set: TargetDiseasesAndIllnessesUndergoneForImmunization	CodeableConcept	1..1	Identification of the condition, problem or diagnosis.	}, "code": { "coding": [{ "system": "http://snomed.info/sct", "code": "14189004", "display": "Measles (disorder)" }] } },
Name of the health professional	Condition.recorder	Reference(CHCorePractitionerRole)	0..1	Individual who recorded the record and takes responsibility for its content.	"recorder": { "reference": "PractitionerRole/6-1-PractitionerRole" }
Severity	Condition.severity Value Set (optional): Condition/DiagnosisSeverity	CodeableConcept	0..1	A subjective assessment of the severity of the condition as evaluated by the clinician.	"severity": [{ "coding": [{ "system": " http://snomed.info/sct ", "code": "255604002", "display": "Mild" }] }],
Symptom	Condition.evidence.code Value Set (optional): ManifestationAndSymptomCodes	CodeableConcept	0..*	A manifestation or symptom that led to the recording of this condition.	"code": [{ "coding": [{ "system": " http://snomed.info/sct ", "code": "1824008", "display": "Allergic gastritis" }] }],
Verification status	Condition.verificationStatus Value Set (optional): ConditionVerificationStatusCodes	CodeableConcept	0..1	The verification status to support the clinical status of the condition.	"verificationStatus": { "coding": [{ "system": "http://terminology.hl7.org/CodeSystem/condition-ver-status", "code": "confirmed", "display": "Confirmed" }] }

Date of disease	Condition.onset[x].onsetDateTime	dateTime	1..1	Estimated or actual date or date-time the condition began, in the opinion of the clinician.	"onsetDateTime" : "1966-11-30T00:00:00+01:00",
Note	Condition.note	Annotation	0..*	Additional information about the Condition. This is a general notes/comments entry for description of the Condition, its diagnosis and prognosis.	"note" : [<ul style="list-style-type: none"> { "text" : "Prick-Test positiv" }],

AllergyIntolerance

Name	Path in exchange format	Type	Cardinality	Description	Example
Allergy or intolerance	AllergyIntolerance.code Value Set: AllergiesAndIntolerancesForImmunization	CodeableConcept	1..1	Code for an allergy or intolerance statement. This may be a code for a substance or pharmaceutical product.	<pre>"code" : { "coding" : [{ "system" : "http://snomed.info/sct", "code" : "213020009", "display" : "Allergy to egg protein (finding)" }] },</pre>
Type	AllergyIntolerance.type Value Set: AllergyIntoleranceType	code	0..1	Identification of the underlying physiological mechanism for the reaction risk.	<pre>"type" : "allergy",</pre>
Extension «ch-vacd-ext-cross-reference» bzw. Attribut «relatesTo»	AllergyIntolerance.extension:relatesTo	Extension	0..1	The definition of a relation of this immunization entry in this document to an immunization entry in an other document.	<pre>"extension" : [{ "extension" : [{ "url" : "entry", "valueReference" : { "reference" : "AllergyIntolerance /TCC05-UNDILL1" } }, { "url" : "document", "valueReference" : { "reference" : "Composition/C-D6-P-C1-Composition" } }], { "url" : "relationcode", "valueCode" : "replaces" }], "url" : "http://fhir.ch/ig/ch-vacd/StructureDefinition/ch-vacd-ext-cross-reference"</pre>
Category	AllergyIntolerance.category Value Set: AllergyIntoleranceCategory	code	0..*	Category of the identified substance.	<pre>"category" : "food",</pre>

Clinical status	AllergyIntolerance.clinicalStatus Value Set: AllergyIntoleranceClinicalStatusCodes	CodeableConcept	0..1	The clinical status of the allergy or intolerance.	"clinicalStatus" : { "coding" : [{ "system" : "http://terminology.hl7.org/CodeSystem/allergyintolerance-clinical", "code" : "active" }] },
Criticality	AllergyIntolerance.criticality Value Set: AllergyIntoleranceCriticality	code	0..1	Estimate of the potential clinical harm, or seriousness, of the reaction to the identified substance.	"criticality" : "low"
Name of the health professional	AllergyIntolerance.recorder	Reference(CHCorePractitionerRole)	0..1	Individual who recorded the record and takes responsibility for its content.	"recorder" : { "reference" : "PractitionerRole/6-1-PractitionerRole" }
Verification status	AllergyIntolerance.verificationStatus Value Set: AllergyIntoleranceVerificationStatusCodes	CodeableConcept	0..1	Assertion about certainty associated with the propensity, or potential risk, of a reaction to the identified substance (including pharmaceutical product).	"verificationStatus" : { "coding" : [{ "system" : "http://terminology.hl7.org/CodeSystem/allergyintolerance-verification", "code" : "confirmed" }] },
Note	AllergyIntolerance.note	Annotation	0..*	Additional narrative about the propensity for the Adverse Reaction, not captured in other fields.	"note" : [{ "text" : "Prick-Test positiv" }],



Overview of used Value Sets

Immunization

- Reason for vaccination - [ImmunizationReasonCodes](#)
- Vaccination protection - [Target disease and illnesses undergone for immunization](#)
- Vaccine - [Swissmedic code for vaccine code](#)
- Immunization status - [ImmunizationStatusCodes](#)

Past Illness

- Clinical status - [ConditionClinicalStatusCodes](#)
- Disease - [TargetDiseasesAndIllnessesUndergoneForImmunization](#)
- Severity - (optional): [Condition/DiagnosisSeverity](#)
- Symptoms - (optional): [ManifestationAndSymptomCodes](#)
- Verification status - (optional): [ConditionVerificationStatusCodes](#)

Allergy and Intolerance

- Allergy or intolerance – [AllergiesAndIntolerancesForImmunization](#)
- Type – [AllergyIntoleranceType](#)
- Category – [AllergyIntoleranceCategory](#)
- Clinical status – [AllergyIntoleranceClinicalStatusCodes](#)
- Criticality – [AllergyIntoleranceCriticality](#)
- Verification status – [AllergyIntoleranceVerificationStatusCodes](#)