FHIR 상세규격(IG) 개발 소개

2023. 11. 27.

(주)헬스올
송 준 현

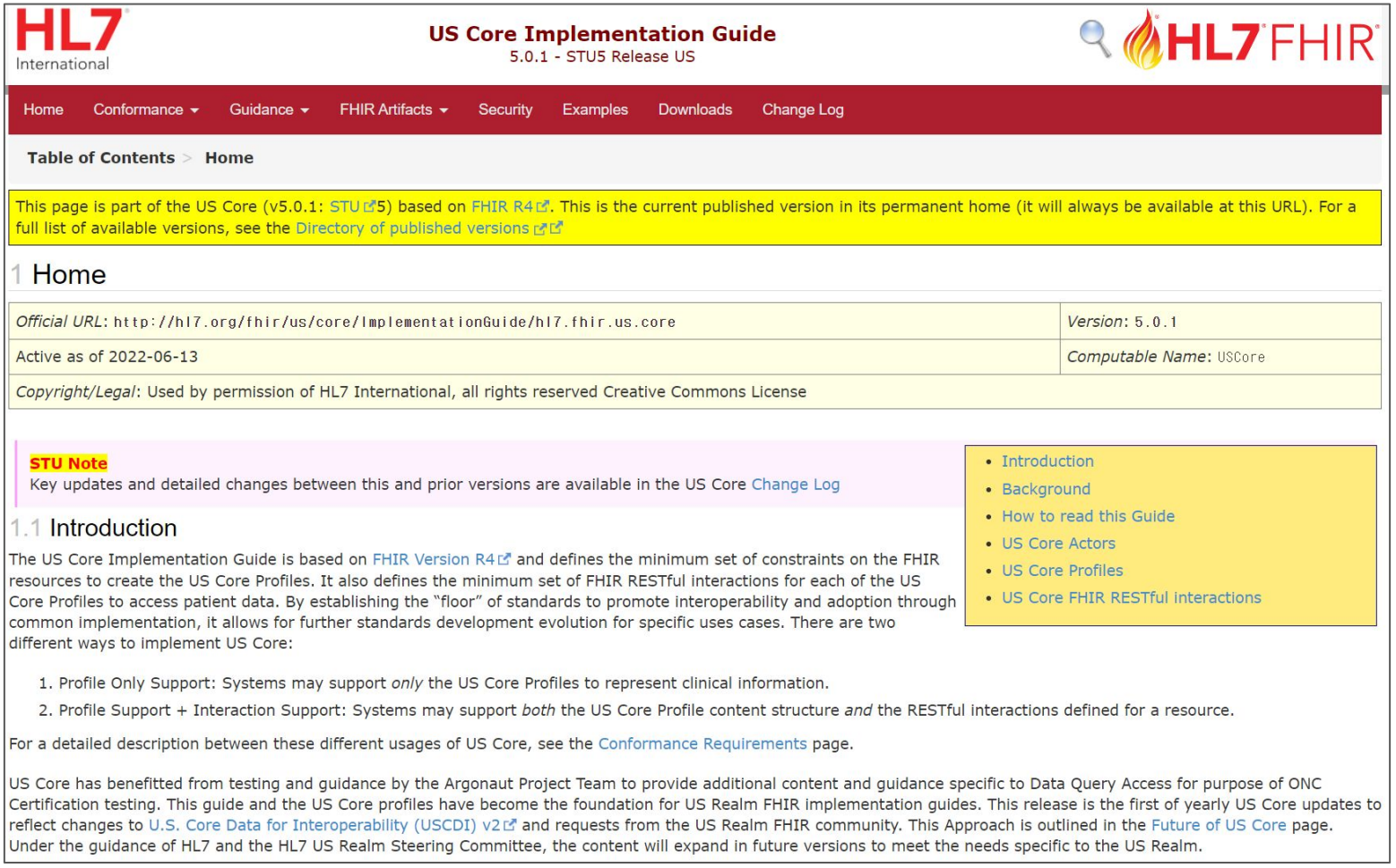
FHIR 상세규격(Implementation Guide: IG)

- 세계 많은 국가들이 국가차원의 FHIR IG를 개발하여 자국의 의료정보 상호운영성 확보와 더불어 의료데이터의 질을 높이기 위해 노력하고 있음

- National FHIR IG Examples
  - US Core (미국), AU Base (호주), CH Core (스위스), Canada Baseline (캐나다), DE Base (독일), Italy Base (이탈리아), India Core (인도) etc

- Other FHIR IG Examples
  - International Patient Summary (IPS), Genetic Reporting, Personal Health Device (PHD), Structured Data Capture (SDC), SMART App Launch IG, SDOH Clinical Care, CARIN IG for Blue Button etc

US Core FHIR IG



HL7 International

US Core Implementation Guide
5.0.1 - STU5 Release US

HL7 FHIR

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Table of Contents > **Home**

This page is part of the US Core (v5.0.1: STU 5) based on FHIR R4. This is the current published version in its permanent home (it will always be available at this URL). For a full list of available versions, see the Directory of published versions

1 Home

Official URL: http://hl7.org/fhir/us/core/ImplementationGuide/hl7.fhir.us.core	*Version*: 5.0.1
Active as of 2022-06-13	*Computable Name*: USCore
Copyright/Legal: Used by permission of HL7 International, all rights reserved Creative Commons License	

STU Note
Key updates and detailed changes between this and prior versions are available in the US Core Change Log

- Introduction
- Background
- How to read this Guide
- US Core Actors
- US Core Profiles
- US Core FHIR RESTful interactions

1.1 Introduction

The US Core Implementation Guide is based on FHIR Version R4 and defines the minimum set of constraints on the FHIR resources to create the US Core Profiles. It also defines the minimum set of FHIR RESTful interactions for each of the US Core Profiles to access patient data. By establishing the "floor" of standards to promote interoperability and adoption through common implementation, it allows for further standards development evolution for specific uses cases. There are two different ways to implement US Core:

1. Profile Only Support: Systems may support *only* the US Core Profiles to represent clinical information.
2. Profile Support + Interaction Support: Systems may support *both* the US Core Profile content structure *and* the RESTful interactions defined for a resource.

For a detailed description between these different usages of US Core, see the Conformance Requirements page.

US Core has benefitted from testing and guidance by the Argonaut Project Team to provide additional content and guidance specific to Data Query Access for purpose of ONC Certification testing. This guide and the US Core profiles have become the foundation for US Realm FHIR implementation guides. This release is the first of yearly US Core updates to reflect changes to U.S. Core Data for Interoperability (USCDI) v2 and requests from the US Realm FHIR community. This Approach is outlined in the Future of US Core page. Under the guidance of HL7 and the HL7 US Realm Steering Committee, the content will expand in future versions to meet the needs specific to the US Realm.

IPS FHIR IG

HL7 International

International Patient Summary Implementation Guide
1.1.0 - STU 1 Update 1

HL7 FHIR

Home | Table of Contents | General Principles and Design | The "IPS" | FHIR Artifacts | Downloads | Copyrights

Table of Contents > **International Patient Summary Implementation Guide**

This page is part of the International Patient Summary Implementation Guide (v1.1.0: STU 1) based on FHIR R4. This is the current published version. For a full list of available versions, see the Directory of published versions

1 International Patient Summary Implementation Guide

Official URL: http://hl7.org/fhir/uv/ips/ImplementationGuide/hl7.fhir.uv.ips		*Version*: 1.1.0
IG Standards status: Trial-use	Maturity Level: 2	*Computable Name*: InternationalPatientSummaryIG

Page standards status: Informative

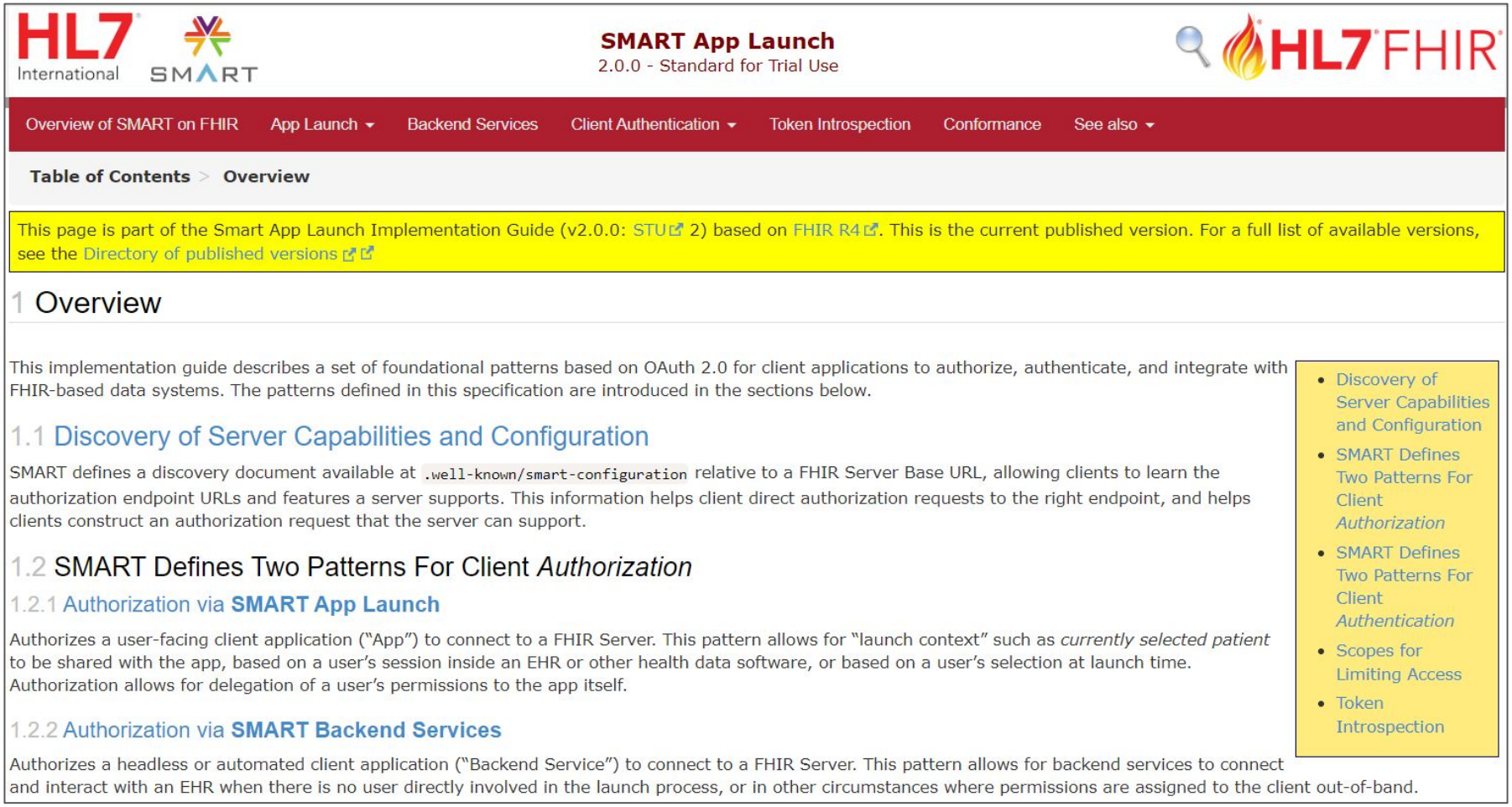
An **International Patient Summary (IPS) document** is an electronic health record extract containing essential healthcare information about a subject of care. As specified in EN 17269 and ISO 27269, it is designed for supporting the use case scenario for 'unplanned, cross border care', but it is not limited to it. It is intended to be international, i.e., to provide generic solutions for global application beyond a particular region or country.

The IPS dataset is **minimal and non-exhaustive; specialty-agnostic and condition-independent; but still clinically relevant**.

The IPS document is composed by a set of robust, well-defined and potentially reusable sets of core data items (indicated as IPS library in the figure below). The tight focus of the IPS on unplanned care is in this case not a limitation, but, on the contrary, facilitates their potential re-use beyond the IPS scope.

Figure 1: The IPS product and by-products

SMART App Launch Framework FHIR IG



HL7 International SMART

SMART App Launch
2.0.0 - Standard for Trial Use

HL7 FHIR

Overview of SMART on FHIR | App Launch | Backend Services | Client Authentication | Token Introspection | Conformance | See also

Table of Contents > **Overview**

This page is part of the Smart App Launch Implementation Guide (v2.0.0: STU 2) based on FHIR R4. This is the current published version. For a full list of available versions, see the Directory of published versions

1 Overview

This implementation guide describes a set of foundational patterns based on OAuth 2.0 for client applications to authorize, authenticate, and integrate with FHIR-based data systems. The patterns defined in this specification are introduced in the sections below.

- Discovery of Server Capabilities and Configuration
- SMART Defines Two Patterns For Client *Authorization*
- SMART Defines Two Patterns For Client *Authentication*
- Scopes for Limiting Access
- Token Introspection

1.1 Discovery of Server Capabilities and Configuration

SMART defines a discovery document available at `.well-known/smart-configuration` relative to a FHIR Server Base URL, allowing clients to learn the authorization endpoint URLs and features a server supports. This information helps client direct authorization requests to the right endpoint, and helps clients construct an authorization request that the server can support.

1.2 SMART Defines Two Patterns For Client *Authorization*

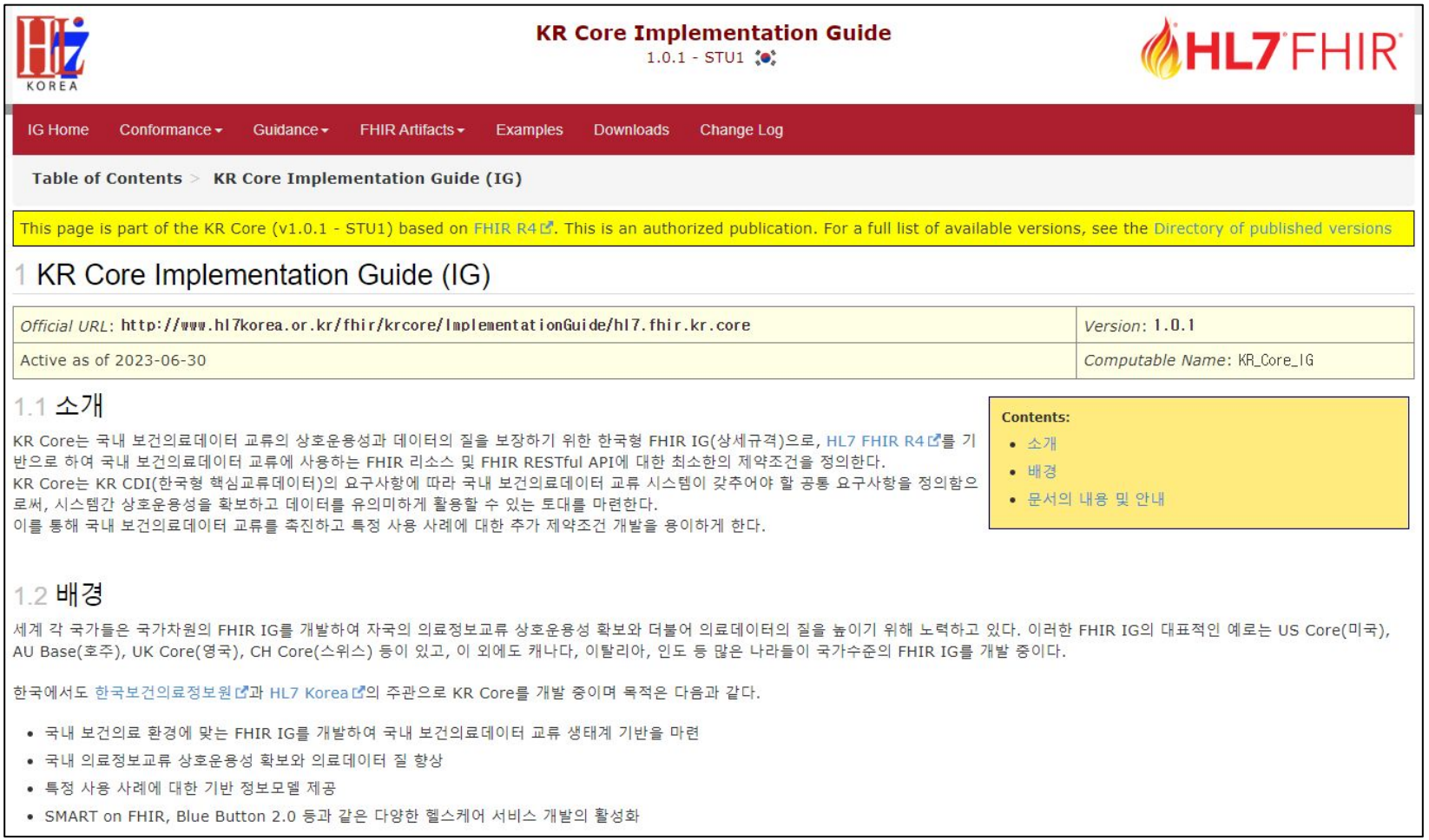
1.2.1 Authorization via **SMART App Launch**

Authorizes a user-facing client application ("App") to connect to a FHIR Server. This pattern allows for "launch context" such as *currently selected patient* to be shared with the app, based on a user's session inside an EHR or other health data software, or based on a user's selection at launch time. Authorization allows for delegation of a user's permissions to the app itself.

1.2.2 Authorization via **SMART Backend Services**

Authorizes a headless or automated client application ("Backend Service") to connect to a FHIR Server. This pattern allows for backend services to connect and interact with an EHR when there is no user directly involved in the launch process, or in other circumstances where permissions are assigned to the client out-of-band.

KR Core FHIR IG



KR Core Implementation Guide
1.0.1 - STU1

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Table of Contents > KR Core Implementation Guide (IG)

This page is part of the KR Core (v1.0.1 - STU1) based on FHIR R4. This is an authorized publication. For a full list of available versions, see the Directory of published versions

1 KR Core Implementation Guide (IG)

Official URL: http://www.hl7korea.or.kr/fhir/krcore/ImplementationGuide/hl7.fhir.kr.core	*Version*: 1.0.1
Active as of 2023-06-30	*Computable Name*: KR_Core_IG

1.1 소개

KR Core는 국내 보건의료데이터 교류의 상호운용성과 데이터의 질을 보장하기 위한 한국형 FHIR IG(상세규격)으로, HL7 FHIR R4를 기반으로 하여 국내 보건의료데이터 교류에 사용하는 FHIR 리소스 및 FHIR RESTful API에 대한 최소한의 제약조건을 정의한다.
KR Core는 KR CDI(한국형 핵심교류데이터)의 요구사항에 따라 국내 보건의료데이터 교류 시스템이 갖추어야 할 공통 요구사항을 정의함으로써, 시스템간 상호운용성을 확보하고 데이터를 유의미하게 활용할 수 있는 토대를 마련한다.
이를 통해 국내 보건의료데이터 교류를 촉진하고 특정 사용 사례에 대한 추가 제약조건 개발을 용이하게 한다.

Contents:
- 소개
- 배경
- 문서의 내용 및 안내

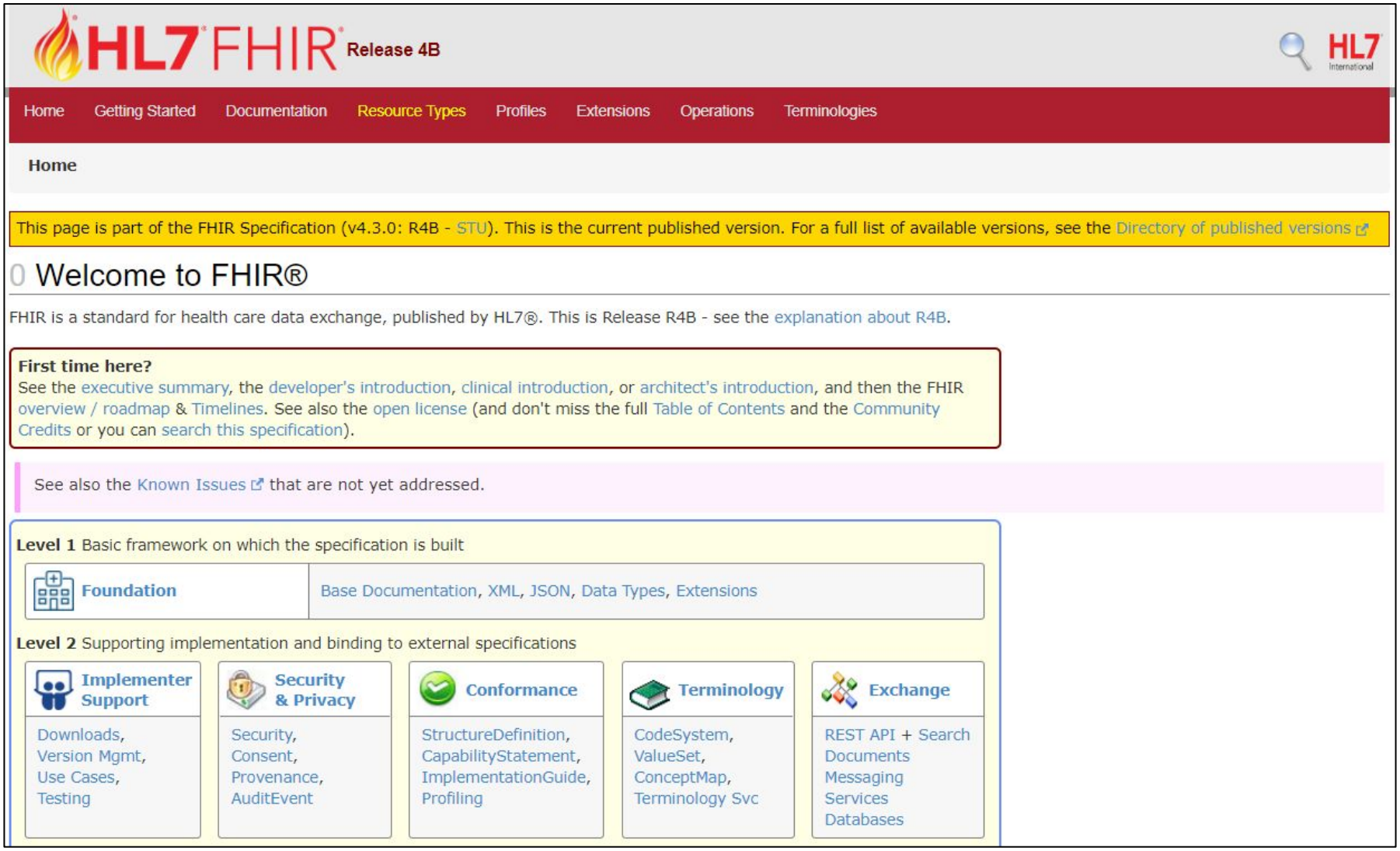
1.2 배경

세계 각 국가들은 국가차원의 FHIR IG를 개발하여 자국의 의료정보교류 상호운용성 확보와 더불어 의료데이터의 질을 높이기 위해 노력하고 있다. 이러한 FHIR IG의 대표적인 예로는 US Core(미국), AU Base(호주), UK Core(영국), CH Core(스위스) 등이 있고, 이 외에도 캐나다, 이탈리아, 인도 등 많은 나라들이 국가수준의 FHIR IG를 개발 중이다.

한국에서도 한국보건의료정보원과 HL7 Korea의 주관으로 KR Core를 개발 중이며 목적은 다음과 같다.

- 국내 보건의료 환경에 맞는 FHIR IG를 개발하여 국내 보건의료데이터 교류 생태계 기반을 마련
- 국내 의료정보교류 상호운용성 확보와 의료데이터 질 향상
- 특정 사용 사례에 대한 기반 정보모델 제공
- SMART on FHIR, Blue Button 2.0 등과 같은 다양한 헬스케어 서비스 개발의 활성화

FHIR as a Base Platform



This page is part of the FHIR Specification (v4.3.0: R4B - STU). This is the current published version. For a full list of available versions, see the Directory of published versions

1.2 Resource Index

FHIR Infrastructure Work Group	Maturity Level: N/A	Standards Status: Informative

This page is provided to help find resources quickly. There is also a more detailed classification, ontology, and description. For background to the layout on the layers in this page, see the Architect's Overview. See also the abstract Base Resources Resource and DomainResource.

Categorized | Alphabetical | R2 Layout | By Maturity | Security Category | By Standards Status | By Committee

Foundation

Conformance	Terminology	Security	Documents	Other
• CapabilityStatement N • StructureDefinition N • ImplementationGuide 1 • SearchParameter 3 • MessageDefinition 1 • OperationDefinition N • CompartmentDefinition 1 • StructureMap 2 • GraphDefinition 1 • ExampleScenario 0	• CodeSystem N • ValueSet N • ConceptMap 3 • NamingSystem 2 • TerminologyCapabilities 0	• Provenance 3 • AuditEvent 3 • Consent 2	• Composition 2 • DocumentManifest 2 • DocumentReference 3 • CatalogEntry 0	• Basic 1 • Binary N • Bundle N • Linkage 0 • MessageHeader 4 • OperationOutcome N • Parameters N • Subscription 3 • SubscriptionStatus 0 • SubscriptionTopic 0

Base

Individuals	Entities #1	Entities #2	Workflow	Management
• Patient N • Practitioner 3 • PractitionerRole 2 • RelatedPerson 2 • Person 2 • Group 1	• Organization 3 • OrganizationAffiliation 0 • HealthcareService 2 • Endpoint 2 • Location 3	• Substance 2 • BiologicallyDerivedProduct 0 • Device 2 • DeviceMetric 1 • NutritionProduct 0	• Task 2 • Appointment 3 • AppointmentResponse 3 • Schedule 3 • Slot 3 • VerificationResult 0	• Encounter 2 • EpisodeOfCare 2 • Flag 1 • List 1 • Library 3

Clinical

Summary	Diagnostics	Medications	Care Provision	Request & Response
• AllergyIntolerance 3 • AdverseEvent 0 • Condition (Problem) 3 • Procedure 3 • FamilyMemberHistory 2 • ClinicalImpression 0 • DetectedIssue 1	• Observation N • Media 1 • DiagnosticReport 3 • Specimen 2 • BodyStructure 1 • ImagingStudy 3 • QuestionnaireResponse 3 • MolecularSequence 1	• MedicationRequest 3 • MedicationAdministration 2 • MedicationDispense 2 • MedicationStatement 3 • Medication 3 • MedicationKnowledge 0 • Immunization 3 • ImmunizationEvaluation 0 • ImmunizationRecommendation 1	• CarePlan 2 • CareTeam 2 • Goal 2 • ServiceRequest 2 • NutritionOrder 2 • VisionPrescription 2 • RiskAssessment 1 • RequestGroup 2	• Communication 2 • CommunicationRequest 2 • DeviceRequest 1 • DeviceUseStatement 0 • GuidanceResponse 2 • SupplyRequest 1 • SupplyDelivery 1

Financial

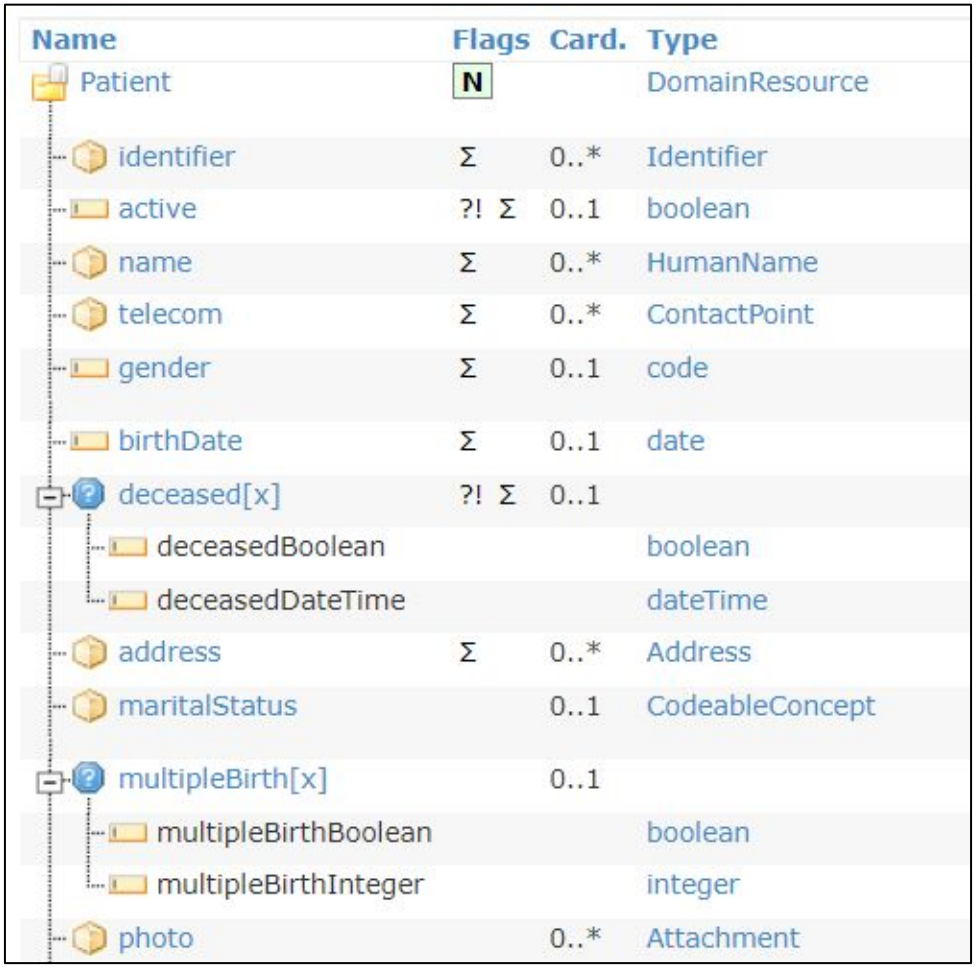
Support	Billing	Payment	General
• Coverage 2 • CoverageEligibilityRequest 2 • CoverageEligibilityResponse 2 • EnrollmentRequest 0 • EnrollmentResponse 0	• Claim 2 • ClaimResponse 2 • Invoice 0	• PaymentNotice 2 • PaymentReconciliation 2	• Account 2 • ChargeItem 0 • ChargeItemDefinition 0 • Contract 1 • ExplanationOfBenefit 2 • InsurancePlan 0

Specialized

Public Health & Research	Definitional Artifacts	Evidence-Based Medicine	Quality Reporting & Testing	Medication Definition
• ResearchStudy 1 • ResearchSubject 0	• ActivityDefinition 3 • DeviceDefinition 0 • EventDefinition 0 • ObservationDefinition 0 • PlanDefinition 3 • Questionnaire 3 • SpecimenDefinition 0	• Citation 0 • Evidence 1 • EvidenceReport 0 • EvidenceVariable 1	• Measure 3 • MeasureReport 3 • TestScript 2 • TestReport 0	• MedicinalProductDefinition 1 • PackagedProductDefinition 1 • AdministrableProductDefinition 1 • ManufacturedItemDefinition 1 • Ingredient 1 • ClinicalUseDefinition 1 • RegulatedAuthorization 1 • SubstanceDefinition 1

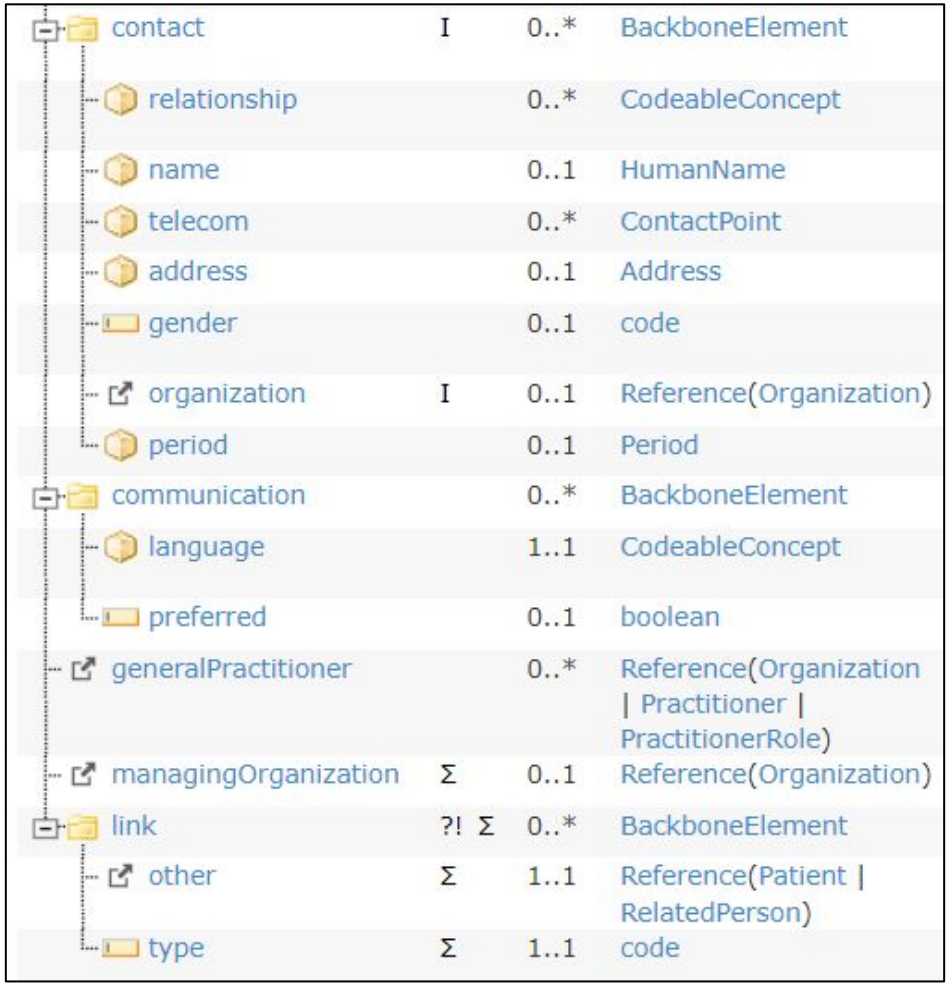
Name	Flags	Card.	Type	Description & Constraints
Patient	N		DomainResource	Information about an individual or animal receiving health care services Elements defined in Ancestors: id, meta, implicitRules, language, text, contained, extension, modifierExtension
identifier	Σ	0..*	Identifier	An identifier for this patient
active	?! Σ	0..1	boolean	Whether this patient's record is in active use
name	Σ	0..*	HumanName	A name associated with the patient
telecom	Σ	0..*	ContactPoint	A contact detail for the individual
gender	Σ	0..1	code	male | female | other | unknown AdministrativeGender (Required)
birthDate	Σ	0..1	date	The date of birth for the individual
deceased[x]	?! Σ	0..1		Indicates if the individual is deceased or not
deceasedBoolean			boolean	
deceasedDateTime			dateTime	
address	Σ	0..*	Address	An address for the individual
maritalStatus		0..1	CodeableConcept	Marital (civil) status of a patient MaritalStatus (Extensible)
multipleBirth[x]		0..1		Whether patient is part of a multiple birth
multipleBirthBoolean			boolean	
multipleBirthInteger			integer	
photo		0..*	Attachment	Image of the patient
contact	I	0..*	BackboneElement	A contact party (e.g. guardian, partner, friend) for the patient *+ Rule: SHALL at least contain a contact's details or a reference to an organization*
relationship		0..*	CodeableConcept	The kind of relationship Patient Contact Relationship (Extensible)
name		0..1	HumanName	A name associated with the contact person
telecom		0..*	ContactPoint	A contact detail for the person
address		0..1	Address	Address for the contact person
gender		0..1	code	male | female | other | unknown AdministrativeGender (Required)
organization	I	0..1	Reference(Organization)	Organization that is associated with the contact
period		0..1	Period	The period during which this contact person or organization is valid to be contacted relating to this patient
communication		0..*	BackboneElement	A language which may be used to communicate with the patient about his or her health
language		1..1	CodeableConcept	The language which can be used to communicate with the patient about his or her health Common Languages (Preferred but limited to AllLanguages)
preferred		0..1	boolean	Language preference indicator
generalPractitioner		0..*	Reference(Organization | Practitioner | PractitionerRole)	Patient's nominated primary care provider
managingOrganization	Σ	0..1	Reference(Organization)	Organization that is the custodian of the patient record
link	?! Σ	0..*	BackboneElement	Link to another patient resource that concerns the same actual person
other	Σ	1..1	Reference(Patient | RelatedPerson)	The other patient or related person resource that the link refers to
type	Σ	1..1	code	replaced-by | replaces | refer | seealso LinkType (Required)

Patient Resource (R4)



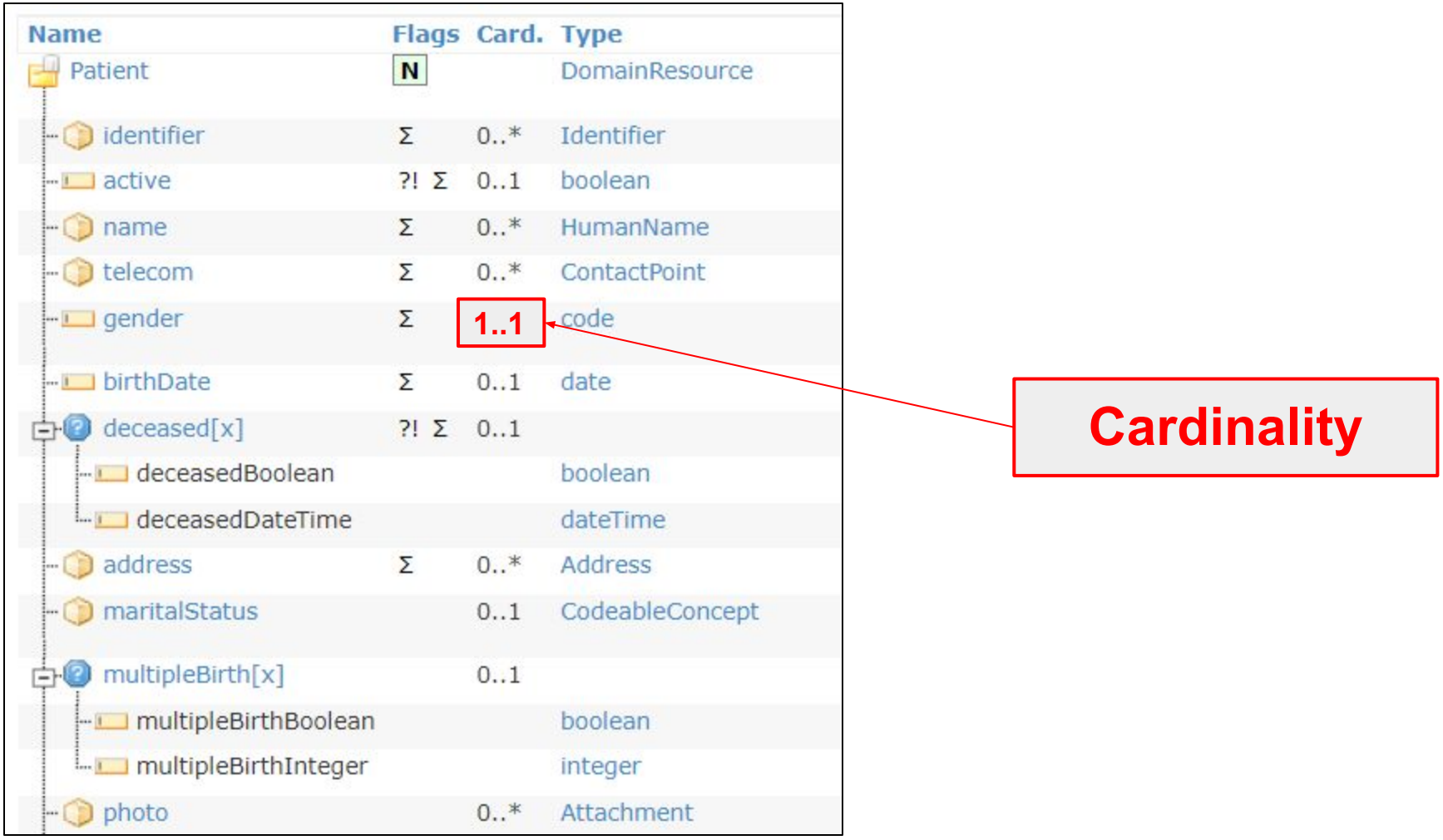
Name	Flags	Card.	Type
Patient	N		DomainResource
identifier	Σ	0..*	Identifier
active	?! Σ	0..1	boolean
name	Σ	0..*	HumanName
telecom	Σ	0..*	ContactPoint
gender	Σ	0..1	code
birthDate	Σ	0..1	date
deceased[x]	?! Σ	0..1	
deceasedBoolean			boolean
deceasedDateTime			dateTime
address	Σ	0..*	Address
maritalStatus		0..1	CodeableConcept
multipleBirth[x]		0..1	
multipleBirthBoolean			boolean
multipleBirthInteger			integer
photo		0..*	Attachment

Patient Resource (R4)

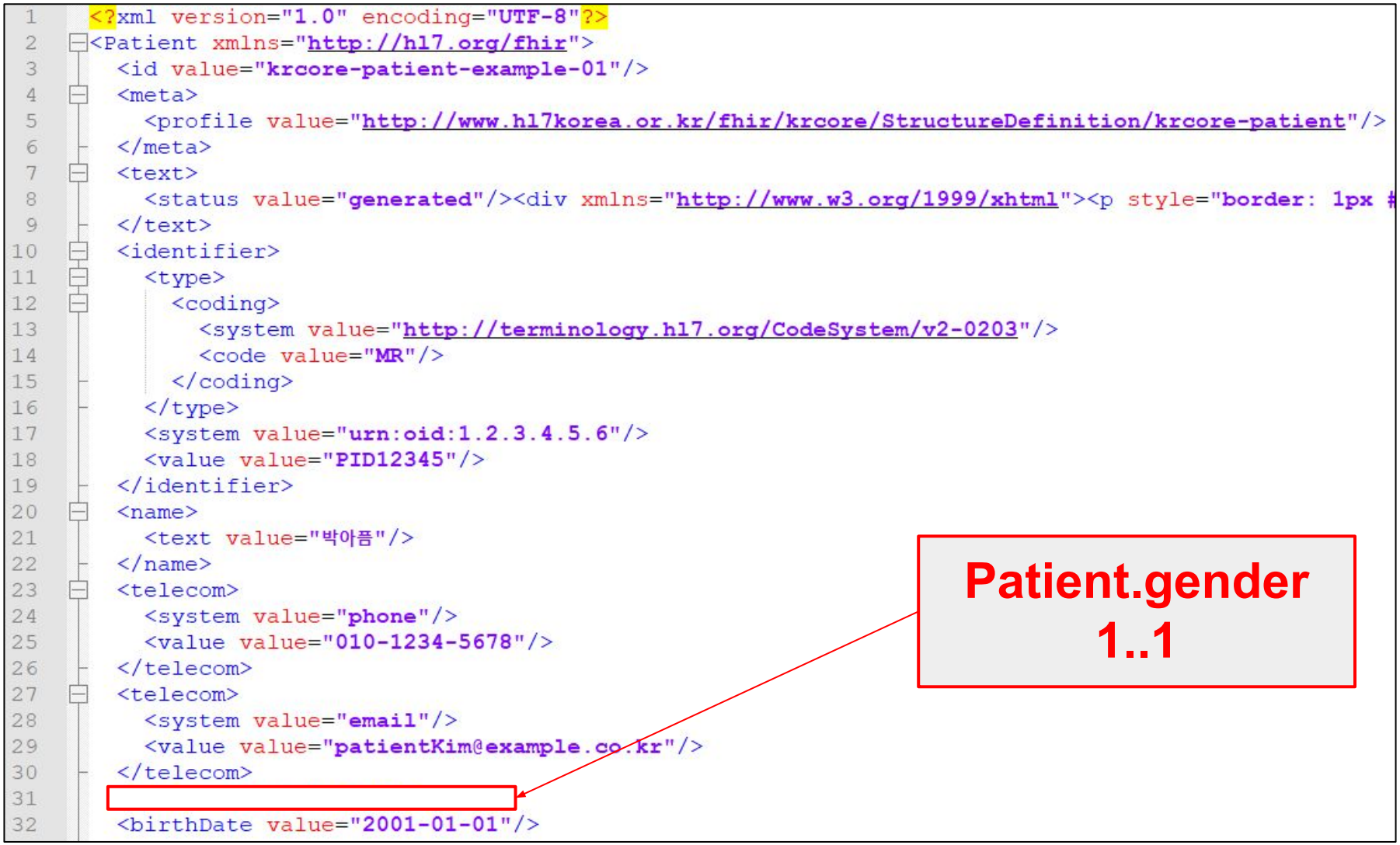


contact	I	0..*	BackboneElement
relationship		0..*	CodeableConcept
name		0..1	HumanName
telecom		0..*	ContactPoint
address		0..1	Address
gender		0..1	code
organization	I	0..1	Reference(Organization)
period		0..1	Period
communication		0..*	BackboneElement
language		1..1	CodeableConcept
preferred		0..1	boolean
generalPractitioner		0..*	Reference(Organization | Practitioner | PractitionerRole)
managingOrganization	Σ	0..1	Reference(Organization)
link	?! Σ	0..*	BackboneElement
other	Σ	1..1	Reference(Patient | RelatedPerson)
type	Σ	1..1	code

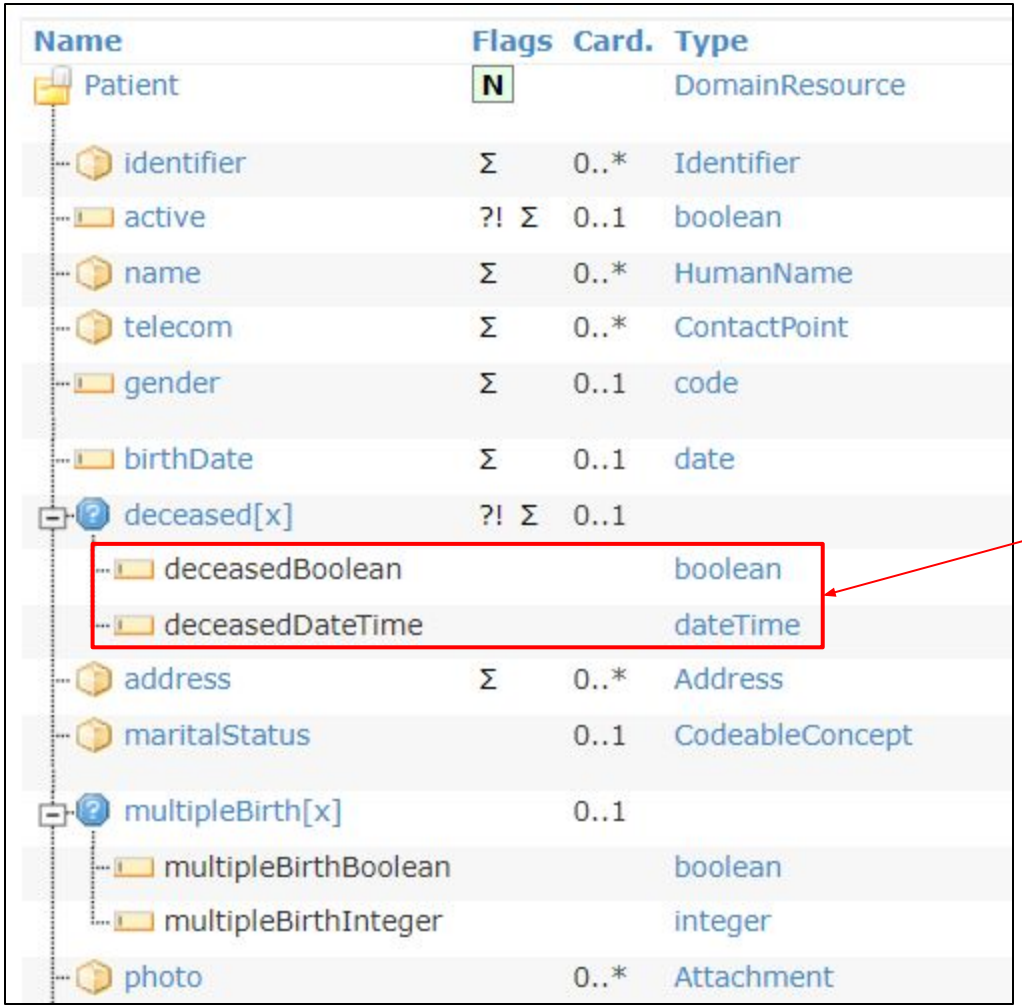
Patient.gender




Patient.gender


Patient.gender
1..1

Patient.deceased[x]



DataType


used as Boolean

```xml
<?xml version="1.0" encoding="UTF-8"?>
<Patient xmlns="http://hl7.org/fhir">
  <id value="krcore-patient-example-01"/>
  <meta>
    <profile value="http://www.hl7korea.or.kr/fhir/krcore/StructureDefinition/krcore-patient"/>
  </meta>
  <text>
    <status value="generated"/><div xmlns="http://www.w3.org/1999/xhtml"><p style="border: 1px
  </text>
  <identifier>
    <type>
      <coding>
        <system value="http://terminology.hl7.org/CodeSystem/v2-0203"/>
        <code value="MR"/>
      </coding>
    </type>
    <system value="urn:oid:1.2.3.4.5.6"/>
    <value value="PID12345"/>
  </identifier>
  <name>
    <text value="박아픔"/>
  </name>
  <telecom>
    <system value="phone"/>
    <value value="010-1234-5678"/>
  </telecom>
  <telecom>
    <system value="email"/>
    <value value="patientKim@example.co.kr"/>
  </telecom>
  <gender value="male"/>
  <birthDate value="2001-01-01"/>
  <deceasedDateTime value="2022-01-01T13:42:00+09:00"/>
```

used as DateTime

Patient.maritalStatus

Name	Flags	Card.	Type	Description & Constraints
Patient	N		DomainResource	Information about an individual or animal rece Elements defined in Ancestors: id, meta, impli
identifier	Σ	0..*	Identifier	An identifier for this patient
active	?! Σ	0..1	boolean	Whether this patient's record is in active use
name	Σ	0..*	HumanName	A name associated with the patient
telecom	Σ	0..*	ContactPoint	A contact detail for the individual
gender	Σ	0..1	code	male | female | other | unknown AdministrativeGender (Required)
birthDate	Σ	0..1	date	The date of birth for the individual
deceased[x]	?! Σ	0..1		Indicates if the individual is deceased or not
deceasedBoolean			boolean	
deceasedDateTime			dateTime	
address	Σ	0..*	Address	An address for the individual
maritalStatus		0..1	CodeableConcept	Marital (civil) status of a patient MaritalStatus (Extensible)

Binding

```xml
<?xml version="1.0" encoding="UTF-8"?>
<Patient xmlns="http://hl7.org/fhir">
  <id value="krcore-patient-example-01"/>
  <meta>
    <profile value="http://www.hl7korea.or.kr/fhir/krcore/StructureDefinition/krcore-patient"/>
  </meta>
  <text>
    <status value="generated"/><div xmlns="http://www.w3.org/1999/xhtml"><p style="border: 1px #
  </text>
  <identifier>
    <type>
      <coding>
        <system value="http://terminology.hl7.org/CodeSystem/v2-0203"/>
        <code value="MR"/>
      </coding>
    </type>
    <system value="urn:oid:1.2.3.4.5.6"/>
    <value value="PID12345"/>
  </identifier>
  <name>
    <text value="박아픔"/>
  </name>
  <telecom>
    <system value="phone"/>
    <value value="010-1234-5678"/>
  </telecom>
  <telecom>
    <system value="email"/>
    <value value="patientKim@example.co.kr"/>
  </telecom>
  <gender value="male"/>
  <birthDate value="2001-01-01"/>
  <maritalStatus>
    <coding>
      <system value="http://terminology.hl7.org/CodeSystem/v3-MaritalStatus"/>
      <code value="M"/>
      <display value="Married"/>
    </coding>
  </maritalStatus>
```

Patient.maritalStatus (HL7 ValueSet)

```xml
<?xml version="1.0" encoding="UTF-8"?>
<Patient xmlns="http://hl7.org/fhir">
  <id value="krcore-patient-example-01"/>
  <meta>
    <profile value="http://www.hl7korea.or.kr/fhir/krcore/StructureDefinition/krcore-patient"/>
  </meta>
  <text>
    <status value="generated"/><div xmlns="http://www.w3.org/1999/xhtml"><p style="border: 1px
  </text>
  <identifier>
    <type>
      <coding>
        <system value="http://terminology.hl7.org/CodeSystem/v2-0203"/>
        <code value="MR"/>
      </coding>
    </type>
    <system value="urn:oid:1.2.3.4.5.6"/>
    <value value="PID12345"/>
  </identifier>
  <name>
    <text value="박아픔"/>
  </name>
  <telecom>
    <system value="phone"/>
    <value value="010-1234-5678"/>
  </telecom>
  <telecom>
    <system value="email"/>
    <value value="patientKim@example.co.kr"/>
  </telecom>
  <gender value="male"/>
  <birthDate value="2001-01-01"/>
  <maritalStatus>
    <coding>
      <system value="http://snomed.info/sct"/>
      <code value="36629006"/>
      <display value="Legally married"/>
    </coding>
  </maritalStatus>
```

Binding to external code system

Patient.address (R4)

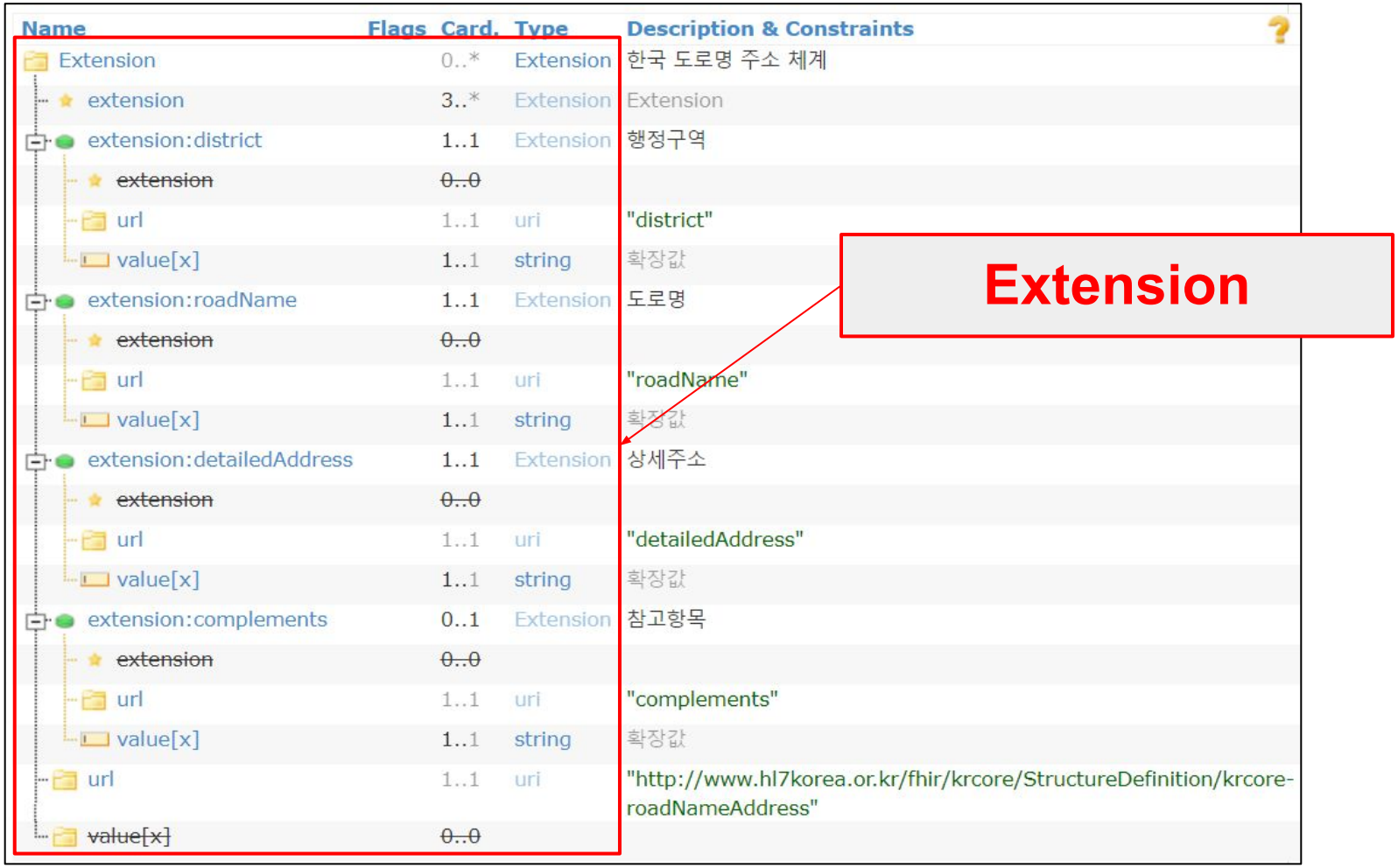
Name	Flags	Card.	Type	Description & Constraints
Address	Σ N		Element	An address expressed using postal conventions (as opposed to GPS or other location definition formats) Elements defined in Ancestors: id, extension
use	?! Σ	0..1	code	home | work | temp | old | billing - purpose of this address AddressUse (Required)
type	Σ	0..1	code	postal | physical | both AddressType (Required)
text	Σ	0..1	string	Text representation of the address
line	Σ	0..*	string	Street name, number, direction & P.O. Box etc. This repeating element order: The order in which lines should appear in an address label
city	Σ	0..1	string	Name of city, town etc.
district	Σ	0..1	string	District name (aka county)
state	Σ	0..1	string	Sub-unit of country (abbreviations ok)
postalCode	Σ	0..1	string	Postal code for area
country	Σ	0..1	string	Country (e.g. can be ISO 3166 2 or 3 letter code)
period	Σ	0..1	Period	Time period when address was/is in use

Patient.address (KR Core)

Name	Flags	Card.	Type	Description & Constraints
Patient		0..*	Patient	KR Core Patient Profile
identifier	S	1..*	Identifier	환자 ID
system	S	1..1	uri	식별체계 식별자
value	S	1..1	string	식별자
name	S	1..*	HumanName	성명
text	S	1..1	string	전체 성명
Slices for telecom		*0..**	*ContactPoint*	*연락처* ***Slice:** 순서 없음, system 값에 대해 열려있음*
telecom:Phone		0..*	ContactPoint	전화번호
system		1..1	code	연락처 유형: phone **고정값:** phone
value		1..1	string	상세 연락처
telecom:E-mail		0..*	ContactPoint	이메일
system		1..1	code	연락처 유형: email **고정값:** email
value		1..1	string	상세 연락처
gender	S	1..1	code	성별: male | female | other | unknown
birthDate	S	1..1	date	생년월일
address		0..*	Address	환자 주소
krcore-roadNameAddress		0..1	(Complex)	한국 도로명 주소 체계 **URL:** http://www.hl7korea.or.kr/fhir/krcore/StructureDefinition/krcore-roadNameAddress
text		0..1	string	주소 텍스트
postalCode		0..1	string	우편번호

KR Core Patient.address

Patient.address (KR Core)



Name	Flags	Card.	Type	Description & Constraints
Extension		0..*	Extension	한국 도로명 주소 체계
extension		3..*	Extension	Extension
extension:district		1..1	Extension	행정구역
~~extension~~		~~0..0~~		
url		1..1	uri	"district"
value[x]		1..1	string	확장값
extension:roadName		1..1	Extension	도로명
~~extension~~		~~0..0~~		
url		1..1	uri	"roadName"
value[x]		1..1	string	확장값
extension:detailedAddress		1..1	Extension	상세주소
~~extension~~		~~0..0~~		
url		1..1	uri	"detailedAddress"
value[x]		1..1	string	확장값
extension:complements		0..1	Extension	참고항목
~~extension~~		~~0..0~~		
url		1..1	uri	"complements"
value[x]		1..1	string	확장값
url		1..1	uri	"http://www.hl7korea.or.kr/fhir/krcore/StructureDefinition/krcore-roadNameAddress"
~~value[x]~~		~~0..0~~		

Patient.address.extension

```
<address>
  <extension url="http://www.hl7korea.or.kr/fhir/krcore/StructureDefinition/krcore-roadNameAddress">
    <extension url="district">
      <valueString value="서울특별시 강남구"/>
    </extension>
    <extension url="roadName">
      <valueString value="일원로"/>
    </extension>
    <extension url="detailedAddress">
      <valueString value="81"/>
    </extension>
    <extension url="complements">
      <valueString value="일원동"/>
    </extension>
  </extension>
  <text value="서울특별시 강남구 일원로 81 (일원동)"/>
  <postalCode value="06351"/>
</address>
```

Profiling Approaches

- Hand editing
- SpreadSheets
- User Interfaces
  - Forge
  - Trifolia on FHIR
- Command-driven
  - FHIR Shorthand

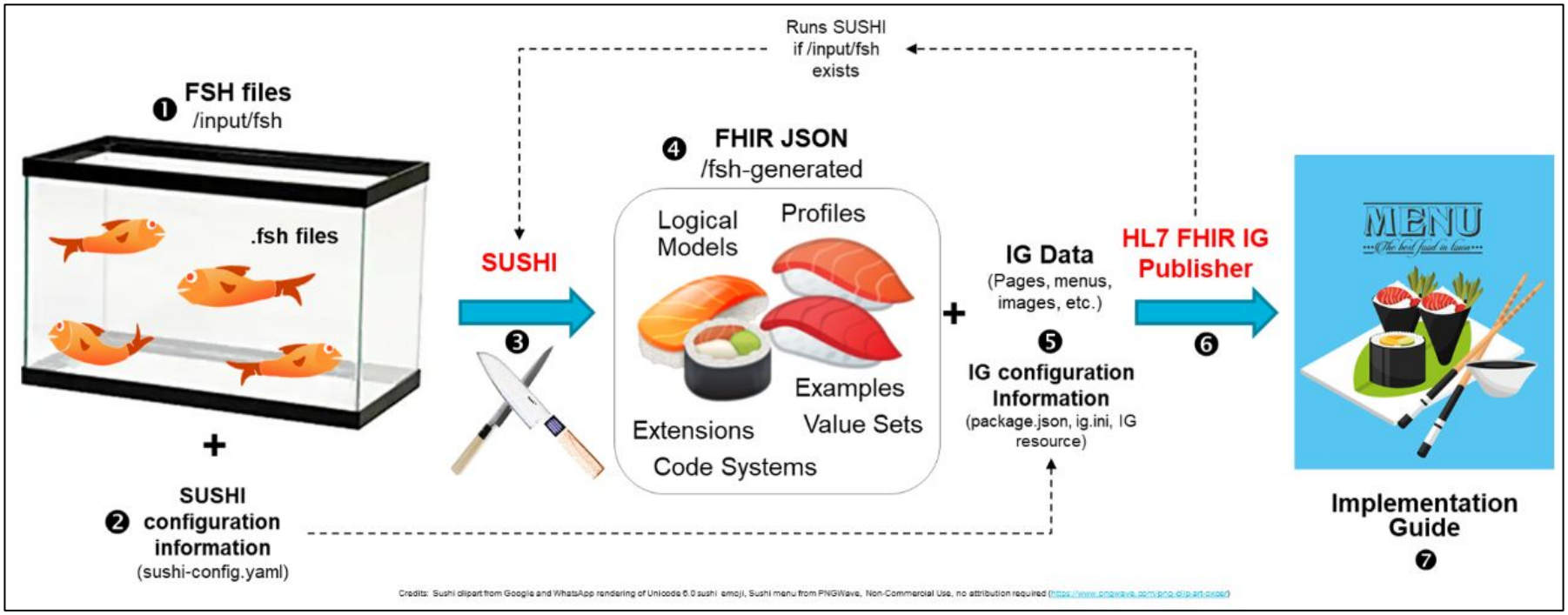
StructureDefinition


```
{
  "resourceType": "StructureDefinition",
  "id": "example-patient-profile",
  "extension": [
    {
      "url": "http://hl7.org/fhir/StructureDefinition/structuredefinition-category",
      "valueString": "Base.Individuals"
    },
    {
      "url": "http://hl7.org/fhir/StructureDefinition/structuredefinition-security-categor
      "valueCode": "patient"
    }
  ],
  "url": "http://example.org/StructureDefinition/example-patient-profile",
  "version": "1.0.0",
  "name": "ExamplePatientProfile",
  "title": "Example Patient Profile",
  "status": "active",
  "description": "Example of a profile of Patient",
  "fhirVersion": "4.0.1",
  "mapping": [
    {
      "identity": "rim",
      "uri": "http://hl7.org/v3",
      "name": "RIM Mapping"
    },
    {
      "identity": "cda",
      "uri": "http://hl7.org/v3/cda",
      "name": "CDA (R2)"
    },
    {
      "identity": "w5",
      "uri": "http://hl7.org/fhir/fivews",
      "name": "FiveWs Pattern Mapping"
    },
    {
      "identity": "v2",
      "uri": "http://hl7.org/v2",
      "name": "HL7 v2 Mapping"
    },
    {
      "identity": "loinc",
      "uri": "http://loinc.org",
      "name": "LOINC code for the element"
    }
  ],
  "kind": "resource",
  "abstract": false,
  "type": "Patient",
  "baseDefinition": "http://hl7.org/fhir/StructureDefinition/Patient",
  "derivation": "constraint",
  "differential": {
    "element": [
      {
        "id": "Patient.name",
        "path": "Patient.name",
        "min": 1
      },
      {
        "id": "Patient.gender",
        "path": "Patient.gender",
        "max": "0"
      },
      {
        "id": "Patient.deceased[x]",
        "path": "Patient.deceased[x]",
        "type": [
          {
            "code": "dateTime"
          }
        ]
      },
      {
        "id": "Patient.maritalStatus",
        "path": "Patient.maritalStatus",
        "binding": {
          "strength": "required",
          "valueSet": "http://hl7.org/fhir/ValueSet/marital-status"
        }
      }
    ]
  }
}
```

FSH Shorthand

```
Profile:     ExamplePatientProfile
Id:          example-patient-profile
Parent:      Patient
Title:       "Example Patient Profile"
Description: "Example of a profile of Patient"

* name 1..*

* gender 0..0

* maritalStatus from http://hl7.org/fhir/ValueSet/marital-status (required)

* deceased[x] only dateTime
```

Profiling and IG



KR Core

KR Core Implementation Guide
1.0.1 - STU1

IG Home | Conformance | Guidance | FHIR Artifacts | Examples | Downloads | Change Log

Table of Contents > **KR Core Implementation Guide (IG)**

This page is part of the KR Core (v1.0.1 - STU1) based on FHIR R4. This is an authorized publication. For a full list of available versions, see the Directory of published versions

1 KR Core Implementation Guide (IG)

Official URL: http://www.hl7korea.or.kr/fhir/krcore/ImplementationGuide/hl7.fhir.kr.core	*Version*: 1.0.1
Active as of 2023-06-30	*Computable Name*: KR_Core_IG

1.1 소개

KR Core는 국내 보건의료데이터 교류의 상호운용성과 데이터의 질을 보장하기 위한 한국형 FHIR IG(상세규격)으로, HL7 FHIR R4를 기반으로 하여 국내 보건의료데이터 교류에 사용하는 FHIR 리소스 및 FHIR RESTful API에 대한 최소한의 제약조건을 정의한다.
KR Core는 KR CDI(한국형 핵심교류데이터)의 요구사항에 따라 국내 보건의료데이터 교류 시스템이 갖추어야 할 공통 요구사항을 정의함으로써, 시스템간 상호운용성을 확보하고 데이터를 유의미하게 활용할 수 있는 토대를 마련한다.
이를 통해 국내 보건의료데이터 교류를 촉진하고 특정 사용 사례에 대한 추가 제약조건 개발을 용이하게 한다.

Contents:

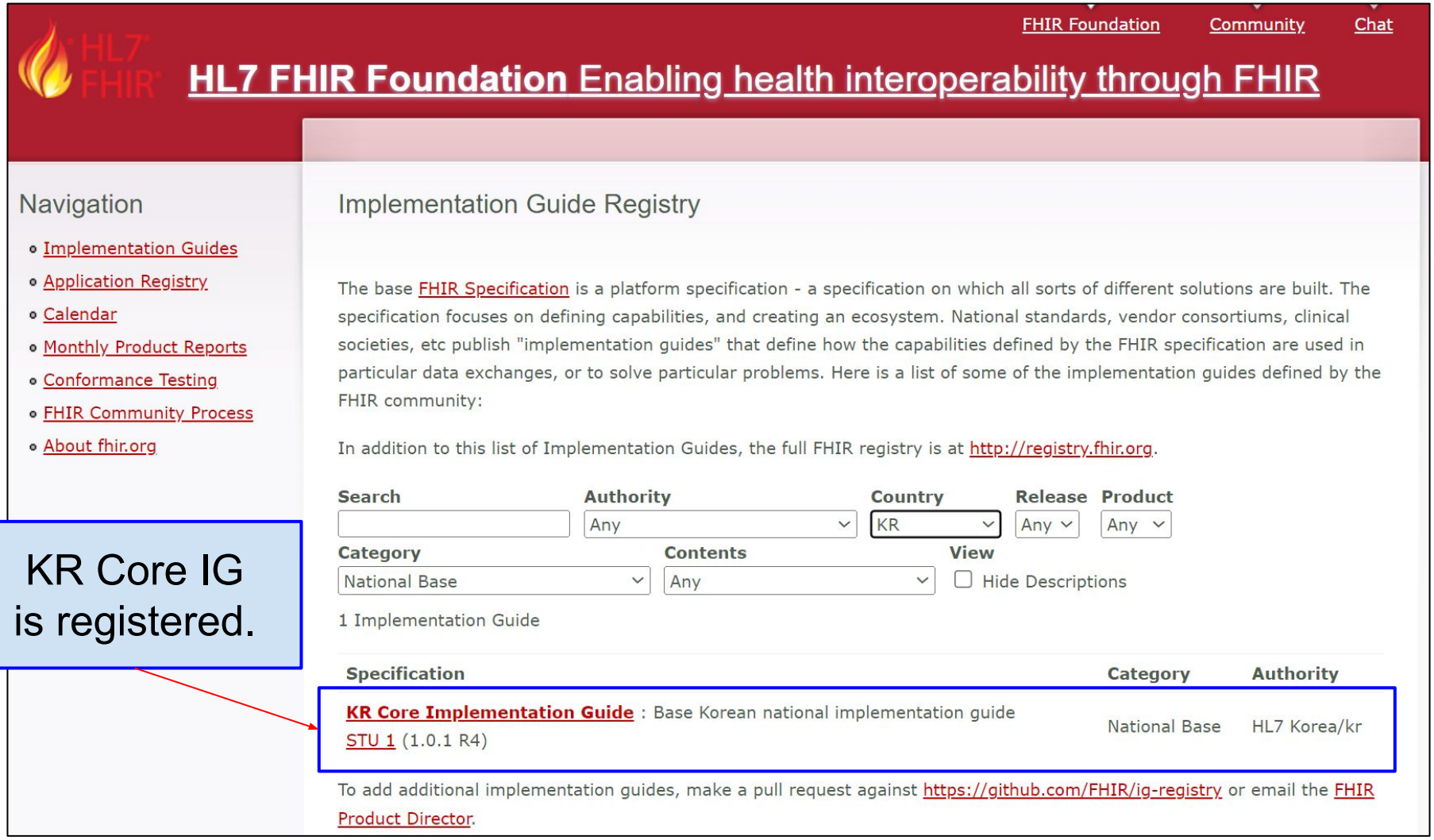
1.2 배경

세계 각 국가들은 국가차원의 FHIR IG를 개발하여 자국의 의료정보교류 상호운용성 확보와 더불어 의료데이터의 질을 높이기 위해 노력하고 있다. 이러한 FHIR IG의 대표적인 예로는 US Core(미국), AU Base(호주), UK Core(영국), CH Core(스위스) 등이 있고, 이 외에도 캐나다, 이탈리아, 인도 등 많은 나라들이 국가수준의 FHIR IG를 개발 중이다.

한국에서도 한국보건의료정보원과 HL7 Korea의 주관으로 KR Core를 개발 중이며 목적은 다음과 같다.

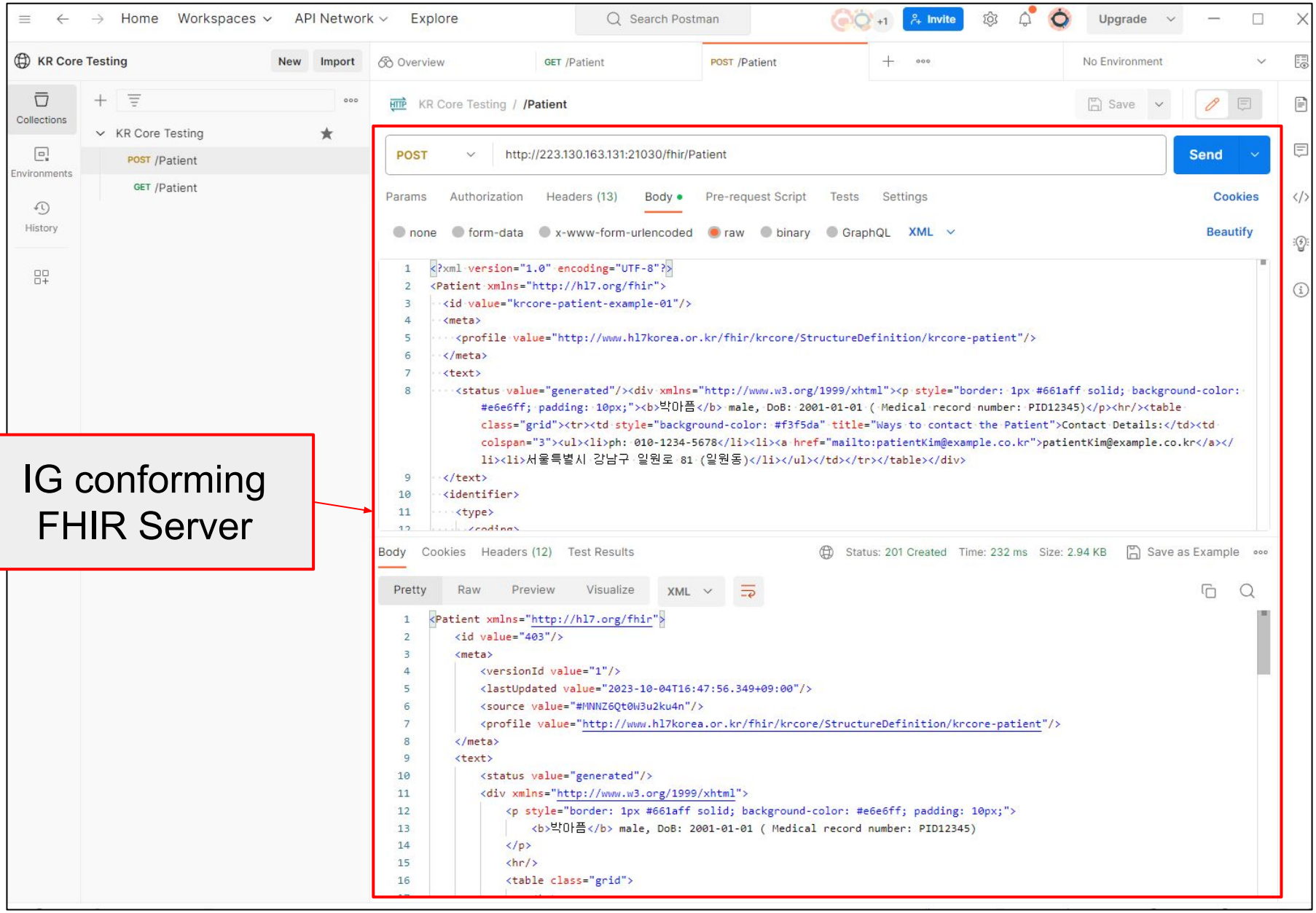
- 국내 보건의료 환경에 맞는 FHIR IG를 개발하여 국내 보건의료데이터 교류 생태계 기반을 마련
- 국내 의료정보교류 상호운용성 확보와 의료데이터 질 향상
- 특정 사용 사례에 대한 기반 정보모델 제공
- SMART on FHIR, Blue Button 2.0 등과 같은 다양한 헬스케어 서비스 개발의 활성화

FHIR IG Registry (http://www.fhir.org)



KR Core IG is registered.

Creating FHIR Resources through Validation


Home
Workspaces
API Network
Explore
Search Postman
Invite
Upgrade
KR Core Testing
New
Import
Overview
GET /Patient
POST /Patient
No Environment
Collections
Environments
History
KR Core Testing
POST /Patient
GET /Patient
KR Core Testing / /Patient
Save
POST
http://223.130.163.131:21030/fhir/Patient
Send
Params
Authorization
Headers (13)
Body
Pre-request Script
Tests
Settings
Cookies
none
form-data
x-www-form-urlencoded
raw
binary
GraphQL
XML
Beautify
<?xml version="1.0" encoding="UTF-8"?>
<Patient xmlns="http://hl7.org/fhir">
<id value="krcore-patient-example-01"/>
<meta>
<profile value="http://www.hl7korea.or.kr/fhir/krcore/StructureDefinition/krcore-patient"/>
</meta>
<text>
<status value="generated"/> 박아픔 male, DoB: 2001-01-01 (Medical record number: PID12345) <hr/><table class="grid"><tr><td style="background-color: #f3f5da" title="Ways to contact the Patient">Contact Details:</td><td colspan="3">ph: 010-1234-5678
patientKim@example.co.kr
서울특별시 강남구 일원로 81 (일원동)</td></tr></table>
</text>
<identifier>
<type>
Body
Cookies
Headers (12)
Test Results
Status: 201 Created
Time: 232 ms
Size: 2.94 KB
Save as Example
Pretty
Raw
Preview
Visualize
XML
<Patient xmlns="http://hl7.org/fhir">
<id value="403"/>
<meta>
<versionId value="1"/>
<lastUpdated value="2023-10-04T16:47:56.349+09:00"/>
<source value="#MNNZ6Qt0W3u2ku4n"/>
<profile value="http://www.hl7korea.or.kr/fhir/krcore/StructureDefinition/krcore-patient"/>
</meta>
<text>
<status value="generated"/>

박아픔 male, DoB: 2001-01-01 (Medical record number: PID12345)

<hr/>
<table class="grid">
IG conforming FHIR Server

```xml
<?xml version="1.0" encoding="UTF-8"?>
<Patient xmlns="http://hl7.org/fhir">
  <id value="krcore-patient-example-01"/>
  <meta>
    <profile value="http://www.hl7korea.or.kr/fhir/krcore/StructureDefinition/krcore-patient"/>
  </meta>
  <text>
    <status value="generated"/><div xmlns="http://www.w3.org/1999/xhtml"><p style="border: 1px #
        "><b>박아픔</b> male, DoB: 2001-01-01 ( Medical record number: PID12345)</p><hr/><table
        title="Ways to contact the Patient">Contact Details:</td><td colspan="3"><ul><li>ph: 010
        co.kr">patientKim@example.co.kr</a></li><li>서울특별시 강남구 일원로 81 (일원동)</li></ul
  </text>
  <identifier>
    <type>
      <coding>
        <system value="http://terminology.hl7.org/CodeSystem/v2-0203"/>
        <code value="MR"/>
      </coding>
    </type>
    <system value="urn:oid:1.2.3.4.5.6"/>
    <value value="PID12345"/>
  </identifier>
  <name>
    <text value="박아픔"/>
  </name>
  <telecom>
    <system value="phone"/>
    <value value="010-1234-5678"/>
  </telecom>
  <telecom>
    <system value="email"/>
    <value value="patientKim@example.co.kr"/>
  </telecom>
  <!--  <gender value="male"/>  -->
  <birthDate value="2001-01-01"/>
```

Patient.gender 요소 삭제

Patient resource (without gender)

```
<OperationOutcome xmlns="http://hl7.org/fhir">
    <text>…
    </text>
    <issue>…
    </issue>
    <issue>
        <severity value="error"/>
        <code value="processing"/>
        <details>
            <coding>
                <system value="http://hl7.org/fhir/java-core-messageId"/>
                <code value="Validation_VAL_Profile_Minimum"/>
            </coding>
        </details>
        <diagnostics value="Patient.gender: minimum required = 1, but only found 0 (from http://www.hl7korea.or.kr/fhir/
            krcore/StructureDefinition/krcore-patient|1.0.0)"/>
        <location value="Patient"/>
        <location value="Line 1, Col 1367"/>
    </issue>
</OperationOutcome>
```

Patient.gender의 Cardinality 오류 발생

Thank you.!