2023 State of FHIR® Survey Results

September 2023

Organized by

HL7 International

fireLy
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BACKGROUND AND PURPOSE

HL7® International and Firely collaborated to conduct this important survey to better understand the widespread adoption and depth of FHIR usage across the world. Additionally, the survey aimed to identify barriers to adoption. To keep the global FHIR community informed and engaged, the survey results were shared at HL7 FHIR DevDays23.

SAMPLE AND METHODOLOGY

An online survey was sent in April 2023 to all HL7 affiliates and other known national standards developers across the globe, with the intent to gather responses from a small number—at least one—of knowledgeable sources from each country.

A total of 32 responses were received from 24 unique countries. Multiple responses were received from: Brazil (2), Canada (2), Germany (4), New Zealand (3) and Peru (2).

Many of the questions were open-ended and allowed the respondent to provide answers specifically tailored to their country's specific situation. It should be noted that responses within the same country were not always congruent. Given the double-digit response rates, the answers provided should be viewed as more qualitative than quantitative.
Detailed Findings
PARTICIPATING COUNTRIES

32 responses were received from 24 unique countries. Multiple responses were received from five countries.

Argentina
Australia
Brazil (2)
Canada (2)
Chile
Colombia
Cyprus
Denmark
Estonia
Finland
France
Germany (4)
Israel
Luxembourg
Mexico
Netherlands
New Zealand (3)
Norway
Peru (2)
Slovakia
Taiwan
Thailand
United Kingdom
United States
WHO RESPONDED?

Of the 32 respondents, 13 were from HL7 affiliates and 19 were from other organizations.

HL7 Affiliates
- HL7 Argentina
- HL7 Australia
- HL7 Brazil (2)
- HL7 Chile
- HL7 Colombia
- HL7 Finland
- HL7 Germany
- HL7 Mexico
- HL7 Peru (2)
- HL7 UK
- HL7 US Realm

Non-HL7 affiliate organizations
- Accenture
- Canada Health Infoway
- University of Cyprus
- Trifork
- TEHfK
- InteropSanté, Agence du Numérique en Santé, Kereval gematik
- Kassenärztliche Bundesvereinigung (KBV)
- Charité Universitätsmedizin Berlin
- Ministry of Health
- Agence eSanté Luxembourg
- Nictiz
- Health New Zealand (3)
- Norwegian Institute of Public Health
- Slovak National Health Information Centre
- National Taipei University of Nursing and Health Sciences
- Thai Health Information Standards Development Center
Q. What change do you expect in the rate of adoption of FHIR in the coming years in [your country]?

Almost all of the respondents (27 of 32) expect the rate of adoption of FHIR to increase in the coming years. Nearly half (15) of respondents said they expect a strong increase in the rate of adoption of FHIR in their respective countries. None of the respondents said they expect adoption to decrease.

3 – Mexico
   Peru
   Taiwan
   Thailand
   United States

4 – Argentina
   Australia
   Chile
   Colombia
   Cyprus
   Denmark
   Germany
   Israel
   Luxembourg
   New Zealand (2)
   Peru

5 – Brazil (2)
   Canada (2)
   Estonia
   Finland
   France
   Germany (3)
   Netherlands
   New Zealand
   Norway
   Slovakia
   United Kingdom
Q. To what extent is FHIR already being used to exchange healthcare data in [your country]?

Chile rated itself highest on the extent to which FHIR is being used in the country. The majority of respondents said FHIR is being used for a few use cases. Three (3) countries, Cyprus, Mexico and Slovakia, reported that FHIR is not yet being used.

0 – Cyprus
  Mexico
  Slovakia

1 – Brazil
  Estonia
  Germany
  Luxembourg
  Peru
  Taiwan

2 – Argentina
  Australia
  Brazil
  Canada
  Colombia
  France
  Germany (2)
  Israel
  Netherlands
  New Zealand
  Peru
  United Kingdom

3 – Canada
  Denmark
  Finland
  Germany
  New Zealand (2)
  Norway
  Thailand
  United States

4 – Chile
**Q.** Is there any regulation in place that prescribes the use of standards in electronic health data exchange?

Nearly all of the respondents (27 of 32) reported that their respective countries had regulation in place for the use of standards in electronic health data exchange.

- **YES regulation in place**
  - Argentina
  - Brazil (2)
  - Canada (2)
  - Chile
  - Colombia
  - Cyprus
  - Denmark
  - Estonia
  - France
  - Germany (4)
  - Luxembourg
  - Mexico
  - Netherlands
  - New Zealand*(2)
  - Norway
  - Peru (2)
  - Slovakia
  - Taiwan
  - Thailand
  - United States

- **NO regulation in place**
  - Australia
  - Israel
  - New Zealand*
  - United Kingdom

- **Don't know**
  - Finland

* contradiction
## SPECIFIC REGULATION

The 27 respondents who said there is regulation in place in their countries were asked to name the most important current regulation that prescribes the use of standards in electronic health data exchange.

<table>
<thead>
<tr>
<th>Country</th>
<th>Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>Ley 27706 PROGRAMA FEDERAL ÚNICO DE INFORMATIZACIÓN Y DIGITALIZACIÓN DE HISTORIAS CLÍNICAS DE LA REPÚBLICA ARGENTINA</td>
</tr>
<tr>
<td>Brazil (2)</td>
<td>NDS - Rede Nacional de Dados de Saúde</td>
</tr>
<tr>
<td>Canada</td>
<td>There are pan-Canadian and Jurisdictional regulations</td>
</tr>
<tr>
<td>Chile</td>
<td>Medical Records for Telemedicine</td>
</tr>
<tr>
<td>Colombia</td>
<td>Resolution 866 of 2021 (Ministry of Health) and Law 2015 of 2020.</td>
</tr>
<tr>
<td>Cyprus</td>
<td>Cyprus National eHealth Law (Law 59 (I)/2019)</td>
</tr>
<tr>
<td>Denmark</td>
<td>N/A</td>
</tr>
<tr>
<td>France</td>
<td>CI-SIS (Interoperability framework of French e-Health agency (ANS))</td>
</tr>
<tr>
<td>Germany (2)</td>
<td>Gesundheits-IT-Interoperabilitäts-Governance-Verordnung</td>
</tr>
<tr>
<td>Germany</td>
<td>Sozialgesetzbuch(SGB) V</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>Art. 60ter of the National Health Fund Code</td>
</tr>
<tr>
<td>Mexico</td>
<td>NOM-024-2012</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Wegiz (Dutch, now), EHDS (Europe, near future)</td>
</tr>
<tr>
<td>New Zealand</td>
<td>HIS0 10083:2020 Interoperability Roadmap</td>
</tr>
<tr>
<td>Norway</td>
<td><a href="https://www.ehelse.no/standardiserings/standarder">https://www.ehelse.no/standardiserings/standarder</a></td>
</tr>
<tr>
<td>Peru</td>
<td>Directiva Administrativa N° 266-MINSA/2019/OGTI: Directiva Administrativa que regula la Interoperabilidad en los Sistema de Información Asistenciales</td>
</tr>
<tr>
<td>Slovakia</td>
<td>Decree 107/2015 of the SK Ministry of Health about healthcare IT standards</td>
</tr>
<tr>
<td>Thailand</td>
<td>The Primary Care HIE specifications</td>
</tr>
<tr>
<td>United States</td>
<td>21st Century Cures + US Core Data for Interoperability</td>
</tr>
</tbody>
</table>
Q. Does the regulation specifically mention FHIR?

Among those respondents who said there is regulation in place, more than half (15 of 27) said FHIR is either mandated or is being advised in their country’s most important regulation that prescribes the use of standards in electronic health data exchange.

YES, FHIR is mandated
- Brazil*
- Germany*
- Netherlands
- New Zealand (2)
- Peru*
- Thailand
- United States

Yes, FHIR is being advised
- Argentina
- Canada
- France
- Germany*
- Norway
- Peru*
- Taiwan

No, FHIR is not mentioned
- Brazil*
- Chile
- Colombia
- Cyprus
- Estonia
- Germany* (2)
- Luxembourg
- Mexico
- Slovakia

Don’t know
- Canada
- Denmark

* contradiction
Q. Is there a deadline for compliance included in the regulation? If yes, what is the (approximate) deadline included in the regulation?

Among those respondents who said there is regulation in place, more than half (15 of 27) said there is no compliance deadline. For those 8 respondents who said there is a deadline, the deadlines ranged from 2008 to 2026.

**Yes/Deadline**
- Chile 2024-08
- Colombia 2025-12-31
- Cyprus 2024-01-13
- Estonia 2008-09-01
- Germany* 2023-06-30
- Germany* 2024-01-01
- Netherlands 2026-12-31
- United States 2022-12-31

**No**
- Argentina
- Brazil (2)
- Canada
- Germany* (2)
- Luxembourg
- Mexico
- New Zealand (2)
- Norway
- Peru (2)
- Taiwan
- Thailand

**Don’t know**
- Canada
- Denmark
- France
- Slovakia

* contradiction
**Q. Are there fines imposed in case the regulation is not met before the deadline?**

Among those respondents who said there is a regulation in place, the majority (17 of 27) said there are no fines if the deadline to comply with the regulation is not met.

### Yes
- Chile
- Cyprus
- Germany*
- Slovakia

### No
- Argentina
- Brazil (2)
- Canada
- Colombia
- Germany* (2)
- Luxembourg
- Mexico
- New Zealand (2)
- Norway
- Peru (2)
- Taiwan
- Thailand
- United States

### Don't know
- Canada
- Denmark
- Estonia
- France
- Germany
- Netherlands

* contradiction
Q. Are there funds available to stimulate the adoption of FHIR?

Nearly half (15 of 32) of respondents said there are funds available to stimulate the adoption of FHIR in their respective countries.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Argentina</td>
<td>Canada</td>
</tr>
<tr>
<td>Canada</td>
<td>Brazil (2)</td>
<td>Netherlands</td>
</tr>
<tr>
<td>Cyprus</td>
<td>Chile</td>
<td>Slovakia</td>
</tr>
<tr>
<td>Estonia</td>
<td>Colombia</td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td>Denmark</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>Germany* (2)</td>
<td></td>
</tr>
<tr>
<td>Germany* (2)</td>
<td>Luxembourg</td>
<td></td>
</tr>
<tr>
<td>Israel</td>
<td>Mexico</td>
<td></td>
</tr>
<tr>
<td>New Zealand (3)</td>
<td>Norway</td>
<td></td>
</tr>
<tr>
<td>Peru*</td>
<td>Peru*</td>
<td></td>
</tr>
<tr>
<td>Taiwan</td>
<td>Thailand</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td>United Kingdom</td>
<td></td>
</tr>
</tbody>
</table>

* contradiction
**STANDARDS DETAIL/OTHER COMMENT**

**Q.** Can you provide any more information about the program and its criteria, including links?

**Q.** Is there anything else you'd like to mention with regard to health data standards regulation in [your country]?

Respondents were given the opportunity to provide additional information and open-ended comments about health data standards regulation in their countries.

**Argentina**


Standards (FHIR mentioned) [https://www.argentina.gob.ar/salud/digital/estandares](https://www.argentina.gob.ar/salud/digital/estandares)


We are working on ePrescription using FHIR.

**Australia**

Department of Health and Aged Care committed in the recent budget to support the development of Foundation FHIR Specifications including a National auCore IG and a FHIR Management Framework.

**Canada**

Funding isn’t currently directly tied to adoption of FHIR but there was a funding announcement from Health Canada in February 2023 regarding additional increases in Canadian Health Transfer Funding to assist with improvements to how health information is collected, shared, used, and reported.

([https://www.canada.ca/en/health-canada/news/2023/02/working-together-to-improve-health-care-for-canadians.html](https://www.canada.ca/en/health-canada/news/2023/02/working-together-to-improve-health-care-for-canadians.html)) The Digital Health Interoperability Program, that has been developed to support these efforts, will support a number of activities tied to legislative and policy change (e.g., elimination of data blocking, integration of standards conformance into pan-Canadian and jurisdictional procurement modernization)

**Canada**

[https://infoscribe.infoway-inforoute.ca/display/PCI](https://infoscribe.infoway-inforoute.ca/display/PCI)

Standards adoption in Digital Health Interoperability is a complex endeavour in Canada. Multiple standards are considered together in the design of pan-Canadina Interoperability. Follow Canada Health Infoway to learn more about the Programs
Chile

Ley 21.541, [https://www.linkedin.com/feed/update/urn:li:activity:7044626862630682624/?origin=SHARED_BY_YOUR_NETWORK](https://www.linkedin.com/feed/update/urn:li:activity:7044626862630682624/?origin=SHARED_BY_YOUR_NETWORK). It’s on discussion on the Chilean Senate the EHR interoperability Law. We are just starting but we hope it will not stop.

Colombia

Although the current government (August 2022), has proposed a structural reform to the health system that could significantly change the advances in digital health, the current regulatory framework allows the adoption of interoperability standards and although HL7 FHIR is not explicitly mentioned in the law, the government team has made some progress in a couple of implementation scenarios such as reports of Covid-19 immunization and notification of adverse events of this vaccine (ESAVI), supported by the Pan American Health Organization. In other scenarios, the FHIR adoption program on the Government side has not advanced significantly (even the FHIR implementation guides for a profile called RDA - Registro Digital de Atención, are no longer available), however, HL7 Colombia and the community of users in the country (official affiliate since June 2022) is working on the design of the FHIR Core Colombia Implementation Guide, which will be published on the HL7 Colombia website in the first half of 2022 and another 2 specifications by the end of 2023 (using the HL7 GI publication recommendations). [https://www.minsalud.gov.co/Normatividad_Nuevo/Resolución%20No.%20866%20de%202021.pdf](https://www.minsalud.gov.co/Normatividad_Nuevo/Resolución%20No.%20866%20de%202021.pdf)

HL7 Colombia and the user community in the country are working collaboratively and consensually on FHIR Implementation Guides to accelerate the adoption of standards.

Cyprus

(1) European Union’s Recovery and Resilience Facility (RRF), (2) The NCP eHealth, and direct funding from EU. In 2019, the National e-Health Authority (NeHA) was established under the national eHealth Law. One of the two main responsibilities of the NeHA is the creation and the management of the national Single Electronic Health Records Bank as well as the regulation of the data banks of the healthcare providers. In January 2023, the Ministry of Health of Cyprus, following the recommendation of the National Electronic Health Authority, issued the first decree requiring every provider to electronically register the data included in the basic citizens’ health data set which is defined based on the standard “Guidelines on Patient Summary” published by the eHealth Network. The decree allows one year from the decree’s effective date for the healthcare providers to implement the decree’s provisions. In parallel, NeHA is in the process of specifying the particular interoperability standards that should be used for the integration of the local healthcare providers’ data banks with the national single EHR data bank.

Estonia

Regulation has been in place as long as the National Health Information System has existed (2008). It has been mandatory to use. Now we are in the transition from CDA to FHIR, regulations will remain the same, but standards change. Standard change is covered in the national eHealth roadmap and strategy documents.
Finland
HL7 Finland funds several FHIR projects (fhir.fi, www.hl7.fi). HL7 Finland has assigned a FHIR Ambassador to drive the adoption of FHIR standards.

France
https://industriels.esante.gouv.fr/segur-du-numerique-en-sante/referencement-segur-vague-

Germany
Sozialgesetzbuch(SGB) V is a set of individual regulations and laws regarding different use-cases, specifications and standards. Granularity of deadlines, details and fines differs. Two examples are §371 SGB V ongoing, §355 SGB V

Germany
ISiK is required for EHR Systems. There are different Modules for Basic exchange of administrative Data, Document exchange, Vitalsigns, Appointment scheduling etc. each have different deadlines for implementation.
Information: https://www.gematik.de/anwendungen/isik
Specification (Basic module): https://simplifier.net/guide/implementierungsleitfadenisik-basismodul-stufe1?version=current. There are other mandatory implementations of FHIR, e.g. ePrescription, Sick note, System Migration (AWST), Verification of Insurance status and many more to come...

Germany
KHZG, InteropCouncil

Israel
In the past 3 years Israel’s MOH has published various programs for funding FHIR implementation directed for hospitals and HMOs, in the sum of 50 millions NIS. Israel's Innovation Authority has funded SMARTonFHIR projects in the sum of 2.3 million NIS and Israel’s FHIR community funded FHIR use cases in the amount of 1 million NIS. The MOH has lately published to the public a draft of Data Portability legislation that will enforce data exchange based on FHIR and SNOMED standards

Luxembourg
https://www.secu.lu/assurance-maladie/livre-i/chapitre-v-relations-avec-les-prestataires-de-soins/art-60ter/ Luxembourg has defined a National Interoperability Framework aligned with the EIF, which includes sectorial committees like eHealth.Agence eSanté defines the eHealth Interoperability Framework as requested by Art. 60ter.

Mexico
https://dof.gob.mx/nota_detalle.php?codigo=5280847&fecha=30/11/2012#gsc.tab=0
Netherlands
https://www.gegevensuitwisselingindezorg.nl/gegevensuitwisseling
The Wegiz law does not go into the exact details but arranges for a process that does. As of this year we are working on a consistent health information framework with defined principles around trust, data access and standards. For the latter, among other things, a baseline has been defined that includes FHIR STU3 and R4.

New Zealand
Health New Zealand operates the Health Information Standards Organisation (HISO) as the standards setter and regulator for Aotearoa New Zealand.

New Zealand

New Zealand
NZ government health agency (Te Whatu Ora \| Health NZ) strongly encourages the use of FHIR and is supporting a variety of initiatives across the sector.

Norway
https://www.ehelse.no/standardisering/standarder
We have levels of recommendations. So far FHIR is recommended, but not required. We have a national standard that has been in use for several years. New implementations will be on FHIR.

Peru
Administrative Directorate, Ministry of Health-MINSA Nro. 266-MINSA/2019/OGTI; Peruvian Government is member of “American Network for the Cooperation on Electronic Health-RACSEL”: http://www.racsel.org/

Peru
The regulation of interoperability standards in Peru is not yet regulated, only a generic standard has been established that is used as a reference to implement some projects. On the other hand, in Peru there is a norm of data standards that is used for the exchange of clinical data, we do not use SNOMED or LOINC, but we do use CIE10.
Slovakia
Currently in SK the standard ISO 13606 is used, with EHDS regulation FHIR is expected to become mandatory for defined use cases also in SK.

Taiwan
FHIR is advised to be adopted in several governmental projects, including funds for medical centers to apply FHIR in practice and for TW core IG, Terminology services, educational events, CDA4FHIR, etc. 2023 is the second year to promote FHIR adoption. The existing standard is the CDA format for EMR exchange.

Thailand
They published in a PDF format. But we also create an IG for it. https://fhir-ig.sil-th.org/mophpci/
I think the problem of health IT in Thailand is that we lack the research on many things. So decision makers tend to use instinct and some expert opinion when they decide things.

United Kingdom
Healthcare policy in the UK tends to be led by the NHS (with governmental oversight), who have some advisory standards, but little that is mandated. FHIR standards (UK Core) are in draft.

United States
ONC Certifies Health IT. Other agencies (CMS, CDC, etc.) require the use or provide monetary incentives.
Q. Is there a national standards organization in [your country] for use of standards in electronic health data exchange?

Nearly all of the respondents (29 of 32) stated there is a national standards organization in their country for use of standards in electronic health data exchange. Respondents were asked to provide the name of the organization.

Yes/Name of organization

- **Argentina**
  - DNSI - Direccion Nacional Sistemas Informacion

- **Australia**
  - Australian Digital Health Agency, Department of Health and Aged Care, CSIRO and HL7au

- **Brazil**
  - HL7 Brazil, ABNT

- **Brazil (2)**
  - HL7 Brazil

- **Canada (2)**
  - Canada Health Infoway

- **Chile**
  - HL7 Chile

- **Colombia**
  - HL7 Colombia and ICONTEC (The ISO representative in the country)

- **Cyprus**
  - No dedicated national standards organization for use of standards in electronic health data exchange. However, the Cyprus Organization for Standardization (CYS) is the National Standardization Body of Cyprus. CYS actively participates in International and European Standardization as a full member of the International Standardization Organizations ISO and ITU, as well as the European Standardization Organizations CEN, CENELEC and ETSI. NeHA is in collaboration with CYS for EHDEX standardization.

- **Denmark**
  - Sundhedsdatastyrelsen

- **Estonia**
  - TEHIK (for most standards)
<table>
<thead>
<tr>
<th>Country</th>
<th>Organization/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland</td>
<td>HL7 Finland</td>
</tr>
<tr>
<td>France</td>
<td>InteropSanté &amp; ANS</td>
</tr>
<tr>
<td>Germany</td>
<td>KBV; gematik</td>
</tr>
<tr>
<td>Germany</td>
<td>DIN</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>Agence eSanté</td>
</tr>
<tr>
<td>Mexico</td>
<td>Asociación para la promoción de la interoperabilidad en salud (APIS)</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Nictiz</td>
</tr>
<tr>
<td>New Zealand (3)</td>
<td>Health Information Standards Organisation (HISO)</td>
</tr>
<tr>
<td>Norway</td>
<td>Directorate of eHealth has the mandate to recommend or require standards for health in Norway</td>
</tr>
<tr>
<td>Peru*</td>
<td>Ministry of Health of Peru</td>
</tr>
<tr>
<td>Slovakia</td>
<td>Slovak National Health Information Centre</td>
</tr>
<tr>
<td>Taiwan</td>
<td>MOHW funds for PMO yearly. PMO can be run by any organization(s).</td>
</tr>
<tr>
<td>Thailand</td>
<td>1) Thai Health Information Standards Development Center 2) Strategy and Planning Division, Ministry of Public Health</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>HL7 UK</td>
</tr>
<tr>
<td>United States</td>
<td>Office of the National Coordinator for Health IT</td>
</tr>
</tbody>
</table>

**No**
- Germany*
- Israel
- Peru*
Q. Is there a national FHIR data model for [your country]?

The vast majority of respondents (26 of 32) confirmed there is a FHIR data model for their country. Respondents were asked to provide the name of the model.

Yes, it is widely used
- France: [https://simplifier.net/packages/hl7.fhir.fr.core](https://simplifier.net/packages/hl7.fhir.fr.core)
- Germany*: [https://simplifier.net/ basisprofil-de-r4](https://simplifier.net/basisprofil-de-r4)
- Netherlands: [https://simplifier.net/nictizstu3-zib2017](https://simplifier.net/nictizstu3-zib2017), [https://simplifier.net/nictiz-r4-zib2020](https://simplifier.net/nictiz-r4-zib2020)

Yes, it is being used in a limited set of use cases
- Argentina: [https://bus.msal.gob.ar/fhir/ar/core/site/index.html](https://bus.msal.gob.ar/fhir/ar/core/site/index.html)
- Denmark: [https://docs.ehealth.sundhed.dk/](https://docs.ehealth.sundhed.dk/)
- Germany*: [https://simplifier.net/Basisprofil-DE-R4](https://simplifier.net/Basisprofil-DE-R4), [https://simplifier.net/base1x0](https://simplifier.net/base1x0)
- New Zealand: [https://simplifier.net/organization/nz-fhir-registry](https://simplifier.net/organization/nz-fhir-registry)
- Norway
Yes, it is under development

Australia  
https://build.fhir.org/ig/hl7au/au-fhir-core/

Brazil  
simplifier RNDS

Brazil  
https://rnds-guia.prod.saude.gov.br/docs/rel/mi-rel/

Canada  
The pan-Canadian FHIR data model for Patient Summary domain was published in 2022. The CA Core+ is currently under development - which will provide FHIR data models for various domains (e.g., primary care, eReferral). This work is informed by the efforts to develop a pan-Canadian Health Data Content Framework (p-CHDCF) which is a collaboration between the Canadian Institute for Health Information, Canada Health Infoway, Stats Canada

Canada  
https://simplifier.net/organization/canadianfhirregistry/-projects

Colombia  
https://simplifier.net/ehealth4u

Cyprus  
https://simplifier.net/ehealth4u

Estonia  
https://simplifier.net/guide/ee-fhir-base?version=current

Finland  
https://simplifier.net/guide/ee-fhir-base?version=current

Germany*  
Simplifier gematik ISIK MII

Israel  
ILCORE - https://simplifier.net/ilcore; and
FHIRIL website: https://en.fhir-il-community.org/fhir-israel-core

Mexico  
Not yet published

United Kingdom  
https://simplifier.net/guide/uk-core-implementation-guide/ Home?version=1.0.0

No

Chile
Luxembourg
Peru (2)
Slovakia
Thailand

* contradiction
Q. Are there any other FHIR standards developed in [your country] for more specific use cases?

A full 26 of 32 respondents said there are other FHIR standards developed for more specific use cases, with 10 respondents saying there are many.

Yes, many
- Canada (2)
- Finland
- France
- Germany (4)
- Netherlands
- United States

Yes, a few
- Argentina
- Australia
- Brazil (2)
- Chile
- Colombia
- Denmark
- Estonia
- Israel
- Luxembourg
- New Zealand (3)
- Norway
- Taiwan
- Thailand

No
- Cyprus
- Mexico
- Peru
- Slovakia
- United Kingdom

Don’t know
- Peru
FHIR USE CASES FROM NATIONAL MODEL

Q. Do these FHIR standards for more specific use cases derive from the national FHIR data model?

20 of 23 respondents said some, or almost all, the FHIR standards developed for more specific use cases do derive from the national FHIR data model.

<table>
<thead>
<tr>
<th>Yes, (almost) all of them</th>
<th>Yes, some of them</th>
<th>No</th>
</tr>
</thead>
<tbody>
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</table>

* contradiction
NATIONAL STANDARDS COMMENTS

Q. Is there anything else you’d like to share on national standards development in [your country]?

Respondents were given the opportunity to provide additional information and open-ended comments about national standards development in their countries.

Australia
Commitment toward the establishment of a FHIR Management Framework including a FHIR Community Process and a FHIR Governance Group. Commitment toward a national accelerator program for National Ids.

Canada
The Canadian FHIR Registry (https://simplifier.net/organization/canadianfhirregistry/~projects) house 45+ FHIR projects that support jurisdictional and use case/domain implementations. Projects related to the Patient Summary domain (ON Patient Summary, AB Patient Summary, BC Patient Summary) are tightly aligned with the pan-Canadian FHIR data model. While other domains are still under development in CA Core+, it is anticipated that part of these efforts will include collaborating with established implementations to confirm alignment to the emerging FHIR data models - and that some of these efforts will be made easier by prior grassroots efforts of the CA FHIR Baseline to harmonize the author community around shared profiling behaviors.

Canada
Canada just developed a 5-year Interoperability Roadmap that will consolidate FHIR specification adoption across the country. More to come.

Chile
HL7 Chile has develop the FHIR Core-Cl that is starting to be used by the government and ecosystem.

Cyprus
Cyprus is active in implementing the Directive 2011/24/EU on patients’ rights in cross-border healthcare an EU Citizen that my travel to another EU country can receive medical care. The EU cross-border healthcare services in Cyprus will go live in the autumn of 2023. More information can be found here: https://wiki.ncpeh.ehealthlab.cs.ucy.ac.cy/index.php/Cross_Border_Services_(Main_Page)

Estonia
We are implementing an information model (logical data model) layer.
Germany
Standards are developed decentralised by various organizations. Efforts for coordination include IOP-Council, KBV, gematik, HL7

Germany
It isn't really derivation from the national base specification, since it doesn't focus on profiles but most specifications in Germany reuse the extensions, constrained datatypes and best practice recommendations defined in the national base spec.

Israel
Israel's FHIR community has an active CORE team in charge of creating the Israeli national FHIR standard. The MOH also has a terminology team in charge of implementing SNOMED CT in Israel's health organizations.

Netherlands
Knowledge institute Nictiz covers most domains, but not all. Zorginstituut NL covers specific domains. Various secondary use domains and some companies do their own development. The nl-core layer which is the foundation everything Nictiz does in FHIR, is in many cases also the source for other parties. Nictiz collaborates intensively with HL7 NL and International to ensure we stay as internationally / generically compatible as possible as we implement the use cases at hand. Nictiz also is home for the functional modeling, and a terminology centre that drive what we do in profiling. The terminology centre includes the Dutch SNOMED NRC and governs use and translations of LOINC among the biggest international systems.

New Zealand
Our national interoperability roadmap is very much about FHIR, SNOMED and IPS adoption across the board.

New Zealand
https://hl7.org.nz/kiwis-on-fhir/

Norway
The Department of ehealth is more and more pointing at FHIR, so we are optimistic and working together with them to move this forward.

Peru
Digital Health Agenda Norm: remarks the interoperability’s relevance and pertinence for healthcare system: in 2030 Peru will have a collaborative, ethic, transversal and interoperable health digital system with integral and integrated process on the healthcare of citizens; in addition, Supreme Decret Nro. 009-2017-SA, Law’s norm Nro. 30024.
Thailand
Not many people doing this. And not many organizations think it's important.

United Kingdom
There are other UK standards in development, and NHS standards which are national level, but not balloted FHIR standards. Other FHIR IGs exist and have been implemented but are not national standards.

United States
We are tired, lots going on.
Who are the main parties adopting FHIR? (multiple choice; multiple answers accepted)

The groups most often cited as adopting FHIR were: EHR vendors (20 respondents), App developers (19 respondents) and care providers (17 respondents). Other single mentions were as follows:

1. Health Information Systems, Jurisdictional Assets/Repositories
2. National services
3. eHealth agency
4. Researchers
5. Some companies, hospitals, HIT vendors, etc.
### WHO IS ADOPTING FHIR (con’t)

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<thead>
<tr>
<th>Country</th>
<th>EHR Vendors</th>
<th>APP Developers</th>
<th>Care Providers</th>
<th>Payers / Insurers</th>
<th>Other</th>
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1 - Health Information Systems, Jurisdictional Assets/Repositories
2 - National services
3 - eHealth agency
4 - Researchers
5 - Some companies, hospitals, HIT vendors, etc.
Q. What are the main drivers for FHIR adoption? (multiple choice; multiple answers accepted)

Respondents most often mentioned Innovation (23) and Regulation and grants (20) when given multiple-choice options about the main drivers for FHIR adoption. Other single mentions were as follows:

1. Improved data analytics and reporting to support care delivery improvements
2. Easy to implement
### PRIMARY DRIVERS OF FHIR ADOPTION (con’t)

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</table>

1 - Improved data analytics and reporting to support care delivery improvements
2 - Easy to implement
**PATIENT ADVOCACY**

16 (Yes)  
15 (No)

**Q.** Are you aware of patient advocacy for availability of healthcare data in [your country]? If yes, do these patient advocacy groups specifically pay attention to health data standards?

There was an even split between the respondents when asked if they were aware of patient advocacy for the availability of healthcare data in their countries. Among those who were aware, 9 said the patient advocacy groups specifically pay attention to health data standards and 5 said they did not. Respondents were asked to share the advocacy group(s) they were aware of.
## PATIENT ADVOCACY (con’t)

<table>
<thead>
<tr>
<th>YES-AWARE OF PATIENT ADVOCACY</th>
<th>ADVOCACY GROUP(S) PAY ATTENTION TO STANDARDS</th>
<th>PATIENT ADVOCACY GROUP(S)</th>
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<td>Patient advocacy is both Government and grass roots supported</td>
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**NO - UNAWARE OF PATIENT ADVOCACY GROUP(S)**

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* contradiction
Q. Are you aware of successful FHIR use cases in [your country]? If yes, what were the main achievements of this/these FHIR use case(s)? (multiple choice; multiple answers accepted).

26 of 32 respondents were aware of successful FHIR use cases in their countries, while 6 were not.

Among those aware, 25 cited the main achievement being improved access to information. Eight (8) respondents each said achievements included lowered cost and improved healthcare outcomes.
**SUCCESSFUL FHIR USE CASES (con't)**

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<th>Lowered Cost</th>
<th>Improved Healthcare Outcomes</th>
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SPECIFIC SUCCESSFUL FHIR USE CASES

Respondents were asked to share successful FHIR use cases.

**Argentina**
Patient Identification - Consent - IPS - ePrescriptions – Immunization

**Australia**
Establishment of National Clinical Terminology Service, Bowel and Cervical Cancer Screening Registries

**Brazil**
RNDS, ConectSUS

**Canada**
ePrescribing facilitated by the PrescribeIT standard

**Canada**
A pan-Canadian Patient Summary specification PS-CA plus several Jurisdictional success stories.

**Chile**
Receta Electrónica Nacional

**Colombia**
2015 Salud SURA (asegurador); 2021 DigitalWare (IT vendor); 2022 (en curso) Fundación Santa Fe de Bogotá (Prestador); 2022 (en curso) Keralty (asegurador); 2022 (en curso) Salud Total (asegurador).

**Cyprus**
Implementation of International Patient Summary for eHealth4U

**Denmark**
FUT

**Estonia**
Clinical Data Viewer (TEHIK); EHR systems; data exchange with EMA Union Product Database
Finland
Kanta PHR (Omatietovanto), fully FHIR based service
- Omaolo, powered by a FHIR server
- Apotti, an Epic installation with many FHIR APIs
- Other FHIR interfaces in national Kanta Services
- CGI, native FHIR interfaces in a domestic EHR system
- Esko, a domestic EHR system using FHIR to communicate with other systems and even internally between Esko's system components
- BCB Medical, Duodecim, Sensotrend as apps, accessing data from EHR systems through FHIR
- Tietoevry + Intersystems, FHIR-enabling a domestic legacy EHR system (demo only) fhir.fi/en/demo2023 with plenty of other examples!

France
Annuaire santé (Healthcare professional directory), Service d’Accès aux Soins (SAS : healthcare access)

Germany
German ePrescription (E-Rezept)

Germany
eAU, eRezept, Verordnungssoftware, Archiv- und Wechselschnittstelle, Medizinische Informationsobjekte(MIO), Kollegensuche, Terminserviceschnittstelle(TSS)

Germany
ePrescription, Medizininformatikinitiative, ISiK, eAU

Israel
Better data sharing between HMOs and hospitals for patient care in defined use cases, Home hospitalization

Netherlands
MedMij - Patient centric infrastructure
Koppeltaal - Mental Health Serious Gaming
ZorgAB - Provider Directory Service

New Zealand
National Health Index (NHI) and Health Provider Index (HPI) FHIR APIs
New Zealand
https://www.centrik.co.nz/blog-posts/fhir-standards-key-to-unlocking-innovation-for-consumer-health-tech
https://medtechglobal.com/alex-platform-a-game-changer

Norway
Norway had the very first FHIR implementation in production back on DSTU2. Still running!

Thailand
I help the development of many projects using FHIR. Most of them could consider success. But it’s not much successful actually. An example project that people seem to use is HealthLink https://www.healthlink.go.th

United Kingdom
There are several notable ones such as Kings Health Partnership (London), SiDER (Somerset Integrated Digital eHealth Record), and the Yorkshire & Humber Care Record

United States
Patient and Provider Access via Apps
Q. What are the biggest challenges for FHIR adoption in your country? (multiple choice; multiple answers accepted)

Lack of FHIR knowledge was cited by nearly all the respondents (29) as the biggest challenge for FHIR adoption. Roughly half of the respondents also noted Unclear regulations (16) and High investment cost (13), along with Unclear benefits (12). Nine (9) respondents provided other answers as follows:

1. Many competing short-term priorities for jurisdictional healthcare ecosystems, multiplicity of health systems with variability in clinical practices and vendor solutions makes semantic harmonization challenging
2. Basic technological infrastructure (hardware and software)
3. Resistance to Change
4. Existing working interfaces, legacy
5. Inconsistent use of FHIR by different organizations
6. Terminology challenges
7. Unclear benefits, unclear regulations, lack of FHIR knowledge
8. Long history in exchange so lots of migration hurdles
9. Lack of experienced implementers
## CHALLENGES TO ADOPTING FHIR (con’t)

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LOOKING FORWARD

Q. Are there any FHIR implementation use cases in the foreseeable future that you are looking forward to?

Respondents were given the opportunity to share FHIR use cases they are looking forward to in the near future.

Argentina
Orders

Australia
MyHR Modernisation Program, e-Requesting, SMART HealthChecks

Canada
eReferral (ideally I’d see an international FHIR Guide) as well as Patient Access, Bulk Data Access, Healthcare & Service Directory, Consent. Long-Term Services and Supports is another use case I’d like to see tackled internationally.

Canada
Yes, eReferral and Primary Care data exchange

Chile
Yes.... insurance and billing, mental health

Colombia
IG Core (Patient, Practitioner, Organization, Coverage), IG profiles for cardiology, oncology

Cyprus
The EU cross-border healthcare services in Cyprus (EU patient summary and ePrescription).

Estonia
New National Health Information System use cases (medication schema; laboratory; referrals)
Finland
Appointment, disclosure information, patient data for wellbeing apps, prescription data for wellbeing apps, wellbeing data for healthcare professionals

France
Healthcare services like bed availability (ROR), Mon Espace Santé, FHIR terminology service, Service d’Accès aux Soins (SAS)

Germany
Patient safety for prescription + Patient summary

Germany
Comprehensive FHIR Validator

Germany
ISiK Level 2 and 3

Germany
Oncology

Israel
Yes - we are currently managing and funding different use cases

Luxembourg
ePrescription (Lab + Pharma), eDispensation, Lab Result

Mexico
Yes.

Netherlands
Integrating EHDS (European Health Data Space) and IPS into our national setup

New Zealand
New Zealand adaptation of IPS

New Zealand
National Immunization Registry (AIR), National Pathology Results API
New Zealand
Health NZ internal efforts for Immunisations, Care Plans, Medicines, and more

Peru
Yes: National Health Electronic Records

Slovakia
Piloting FHIR implementation use cases for Hospital Discharge reports within XpanDH project

Taiwan
Public health surveillance, EHR, and insurance claim

Thailand
I can think of some. But they are not that important anyway.

United Kingdom
FHIR projects such as re-implementation of national level (England) patient demographics services in FHIR, to supplement HL7 V3 interfaces. Wales and England are both working on different aspects of national level pathology using FHIR.

United States
Bulk, SMART Health Links, Easy access to 'second opinions', Image SHARING!
FHIR IMPLEMENTATION COMMENTS

Q. Is there anything else you’d like to share on FHIR implementation in [your country]?

Respondents were invited to share open-ended comments about FHIR implementation in their respective country.

Canada
There is a lot of work coming but it is aligned with international trends (e.g., IPS, IPA)

Cyprus
FHIR is expected to be adopted as the main interoperability standard for the national EHR system of Cyprus by law and NeHA will actively help eHealth systems’ implementers for the adoption.

Estonia
CDA to FHIR transition for national use cases is planned to be slow, and both standards will remain usable in parallel for upcoming years.

Finland
First Finnish base level implementation guides (base profiles, smart app launch) have gone through the ballot process and are being polished for publication.

Germany
Our main issue is that we do not have ONE FHIR Spec but many and they are mostly incompatible due to restrictive profiling based on arbitrary data protection requirements.

Luxembourg
Where applicable, we prefer for the new health interoperability projects to use FHIR (Structure + API)

Netherlands
The earliest implementation was/is in DSTU1. The biggest current adoption is in STU3. R4 is what we are gearing up for with some going live this year. With every step we make in adoption, the enthusiasm for newer versions goes down. Mostly because of (perceived) upgrade issues. Backward compatibility and stability become more and more key. Our biggest challenge in specifying is to keep international compatibility as much as possible. Whatever “international” means by the way because more than often this aims at a point-in-time IG. Such IGs tend to have less intentional eye for reuse between guides over time.
**New Zealand**
A good mixture of public and private sector implementations with a solid base of patient directory, provider directory, medication data and terminology services all at a national level. IPS Derivation implemented by our largest GP system provider.

**United Kingdom**
The release of UK Core should encourage more FHIR adoption in general, although it is not a specific use case or programme.

**United States**
So much activity it’s hard to keep track of!
We wish to thank the following individuals for contributing their responses to this survey:

Sheridan Cook, Canada, Accenture
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Jens Kristian Villadsen, Denmark, Trifork
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Sylvia Thun, Germany, Charité Universitätsmedizin Berlin
Mario Enrique CORTES, Colombia, HL7 Colombia
Styp Canto Rondón, Peru, HL7 Perú
César Galindo, Chile, HL7 Chile
Victor Medina, Mexico, HL7 Mexico
And others
Founded in 1987, Health Level Seven® International (HL7) is an ANSI-accredited non-profit organization that empowers global health data interoperability by developing standards and enabling their adoption and implementation. In alignment with HL7’s vision of “a world where everyone can securely access and use the right health data when and where they need it”, HL7 created HL7 FHIR®, leveraging the latest web standards and applying a tight focus on implementability. HL7 affiliates have been established in more than 30 countries, and HL7 members represent approximately 500 corporate members, which include more than 90 percent of the information systems vendors serving healthcare. HL7 collaborates with other standards developers and providers, payers, philanthropic, and government agencies at the highest levels to ensure the development of comprehensive and reliable standards and successful interoperability efforts.

Firely provides all the software, training, and expertise to bring FHIR to life. We are one of the initiators of FHIR. The Firely team has been involved in FHIR since the beginning and is continuously contributing to the standard. Our 100% FHIR-based solutions enable compliance and innovation in one go. Our flagship products are Firely Server, Simplifier.net, and the open-source .NET SDK. Our software powers FHIR APIs and systems around the world. Governments, hospitals, payers, and HealthTech companies rely on our solutions for their FHIR capabilities. Besides software products, we offer training and consulting services to support our customers with their FHIR implementation. We play a prominent role in the FHIR Community and are the driving force behind FHIR DevDays, the world’s foremost FHIR event.