

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.

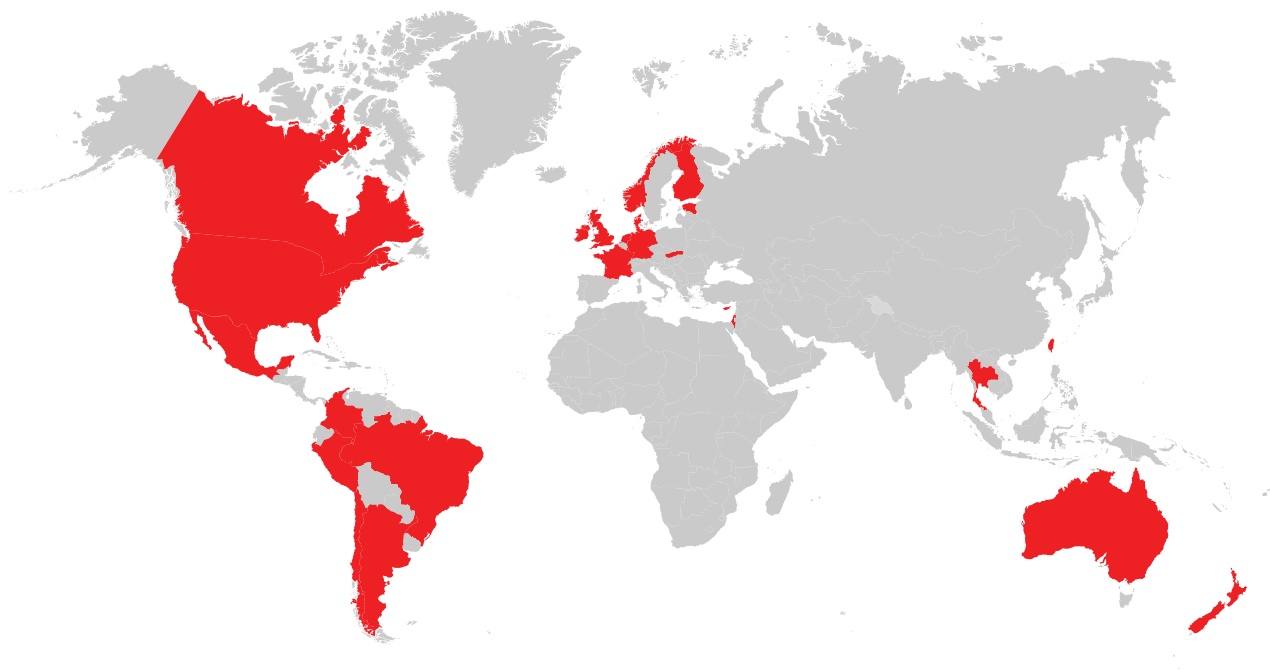
A total of 32 responses were received from 24 unique countries. Multiple responses were received from: Brazil (2), Canada (2), Germany (4), New Zealand (3) and Peru (2).

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

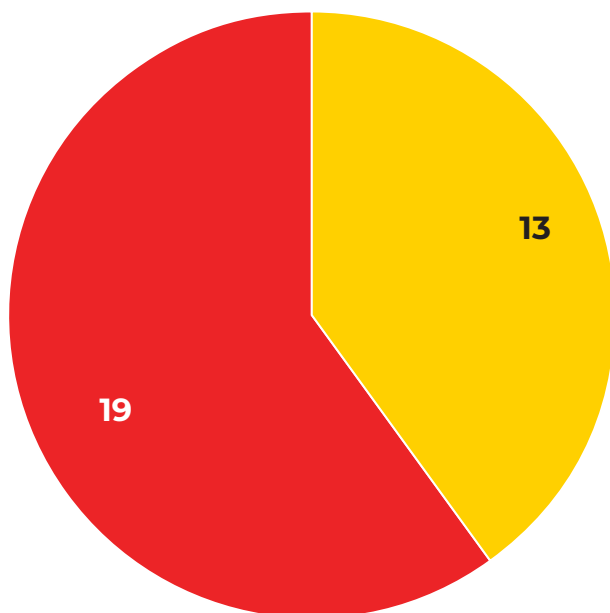
Cyprus
Denmark
Estonia
Finland
France
Germany (4)

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.



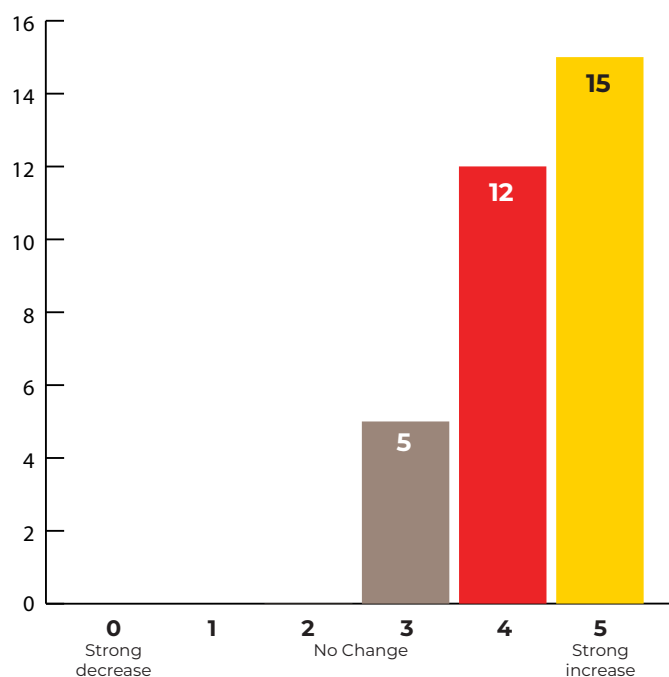
HL7 Affiliates

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
 TEHIK
 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

FHIR ADOPTION RATE CHANGE



Q. What change do you expect in the rate of adoption of FHIR in the coming years in [your country]?

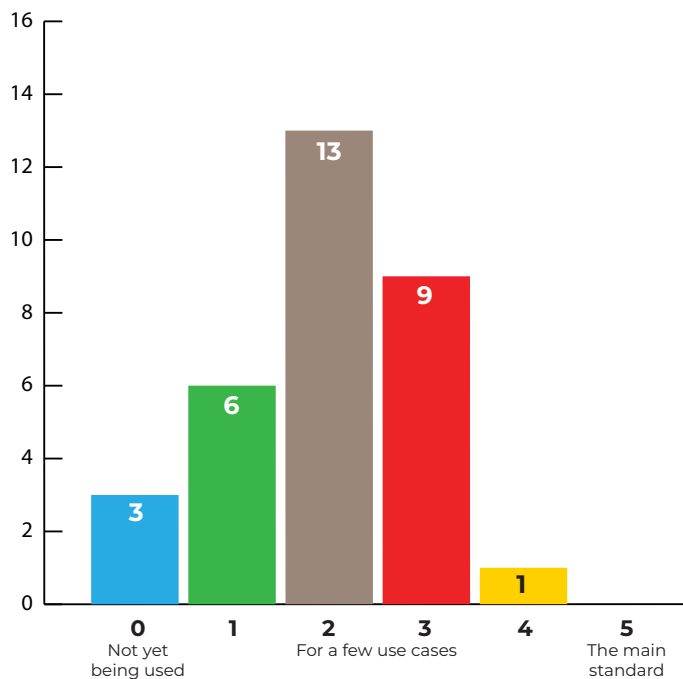
Almost all of the respondents (27 of 32) expect the rate of adoption of FHIR to increase in the coming years. Nearly half (15) of respondents said they expect a strong increase in the rate of adoption of FHIR in their respective countries. None of the respondents said they expect adoption to decrease.

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

FHIR CURRENT USE



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

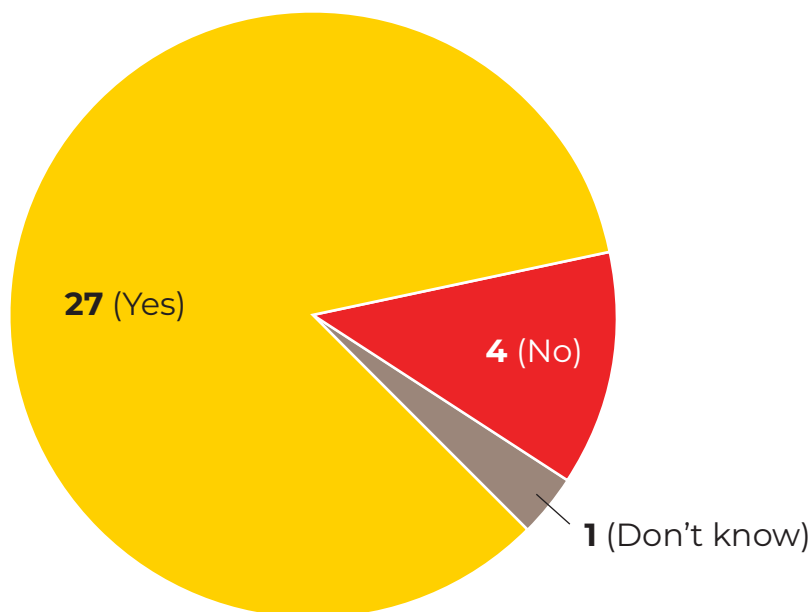
Australia
Brazil
Canada
Colombia
France
Germany (2)
Israel
Netherlands
New Zealand
Peru
United Kingdom

3 – Canada

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

4 – Chile

CURRENT REGULATION



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

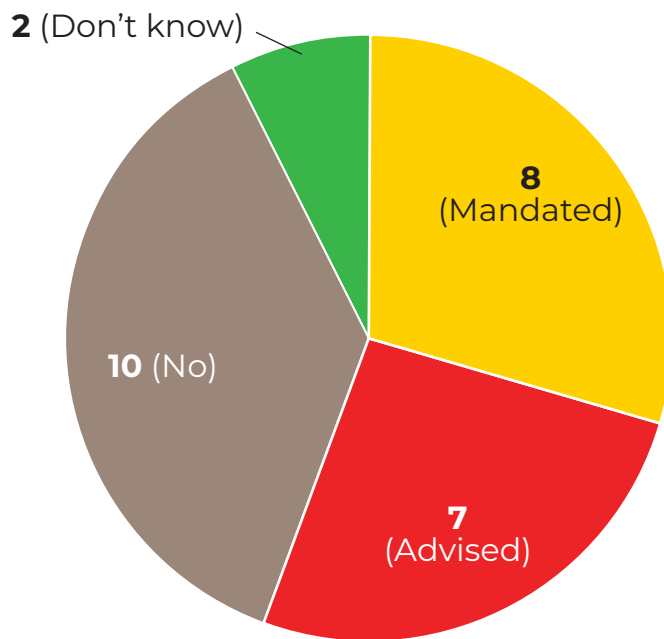
* contradiction

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.

Argentina	Ley 27706 PROGRAMA FEDERAL ÚNICO DE INFORMATIZACIÓN Y DIGITALIZACIÓN DE HISTORIAS CLÍNICAS DE LA REPÚBLICA ARGENTINA
Brazil (2)	NDS - Rede Nacional de Dados de Saúde
Canada	Currently, there is no Pan-Canadian/Federal legislation mandating certain standards for health exchange. However, there are Provincial Regulation changes that are beginning to mandate the use of standards (e.g., PHIPA AMENDING O. REG. 329/04))
Canada	There are pan-Canadian and Jurisdictional regulations
Chile	Medical Records for Telemedicine
Colombia	Resolution 866 of 2021 (Ministry of Health) and Law 2015 of 2020.
Cyprus	Cyprus National eHealth Law (Law 59 (I)/2019)
Denmark	N/A
Estonia	Tervishoiuteenuste korraldamise seadus (English version: https://www.riigiteataja.ee/en/eli/510042023001/consolide)
France	CI-SIS (Interoperability framework of French e-Health agency (ANS))
Germany	Gesundheits-IT-Interoperabilitäts-Governance-Verordnung
Germany (2)	Sozialgesetzbuch(SGB) V
Germany	ISiK
Luxembourg	Art. 60ter of the National Health Fund Code
Mexico	NOM-024-2012
Netherlands	Wegiz (Dutch, now), EHDS (Europe, near future)
New Zealand (2)	HISO 10083:2020 Interoperability Roadmap
Norway	https://www.ehelse.no/standardisering/standarder
Peru	Digital Government Law-Norm: DL.Nro. 1412, PCM; Government Interoperability Plattform:Interoperability Standards;Digital Government Secretary Resolution; Nro. 002-20019-PCM/SEGDI, page 18
Peru	Directiva Administrativa N° 266-MINSA/2019/OGTI: Directiva Administrativa que regula la Interoperabilidad en los Sistema de Información Asistenciales
Slovakia	Decree 107/2015 of the SK Ministry of Health about healthcare IT standards
Taiwan	https://emr.mohw.gov.tw/myemr/index.html , https://eec.mohw.gov.tw/new/Home/Brief
Thailand	The Primary Care HIE specifications
United States	21st Century Cures + US Core Data for Interoperability

REGULATION MENTION FHIR



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

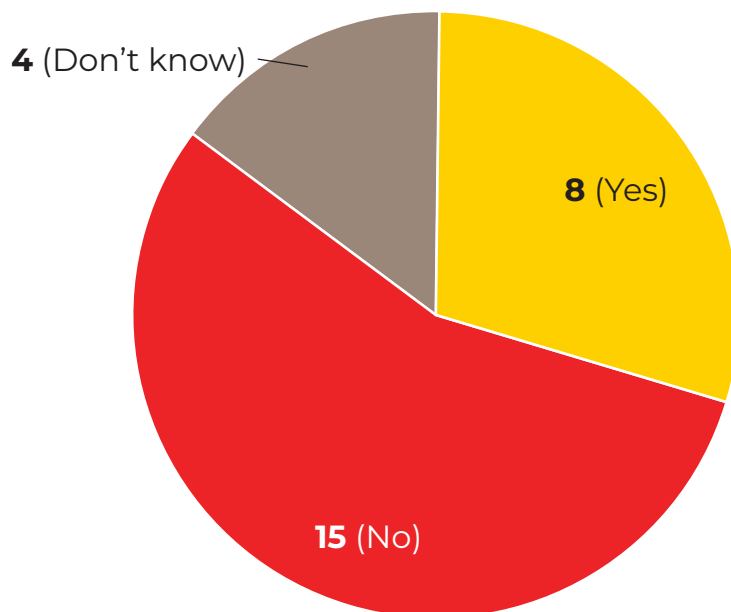
Brazil*
Chile
Colombia
Cyprus
Estonia
Germany* (2)
Luxembourg
Mexico
Slovakia

Don't know

Canada
Denmark

* contradiction

REGULATION DEADLINE AND DATE



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

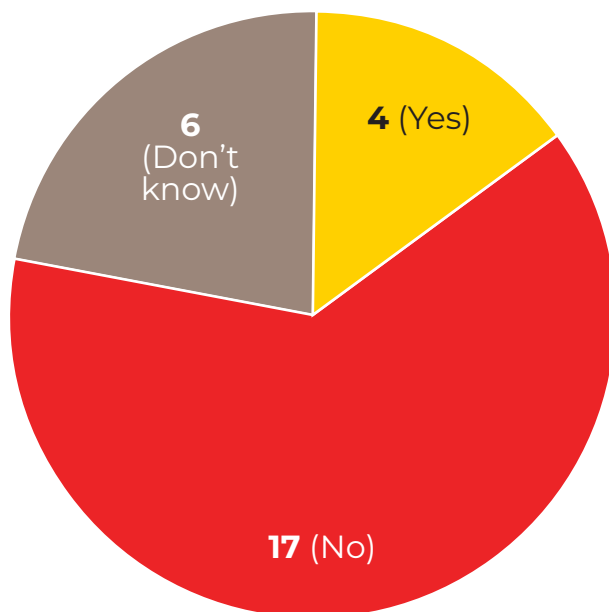
Argentina
Brazil (2)
Canada
Germany* (2)
Luxembourg
Mexico
New Zealand (2)
Norway
Peru (2)
Taiwan
Thailand

Don't know

Canada
Denmark
France
Slovakia

* contradiction

REGULATION FINES



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

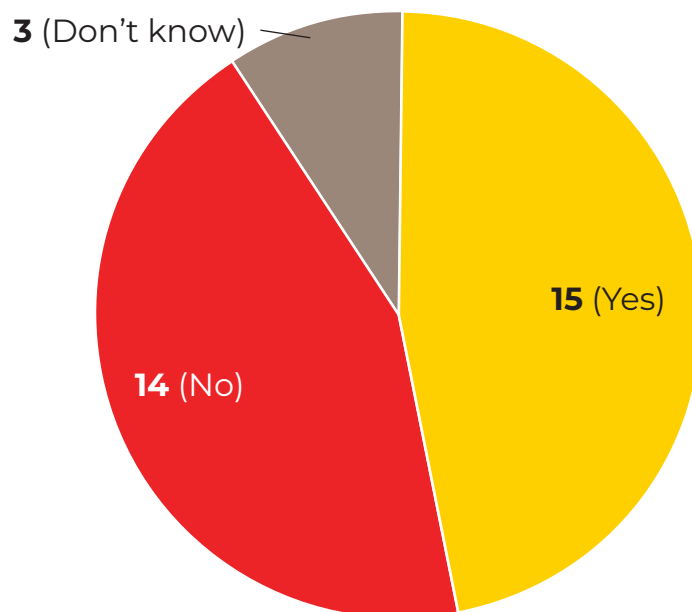
Argentina
Brazil (2)
Canada
Colombia
Germany* (2)
Luxembourg
Mexico
New Zealand (2)
Norway
Peru (2)
Taiwan
Thailand
United States

Don't know

Canada
Denmark
Estonia
France
Germany
Netherlands

* contradiction

FUNDS TO STIMULATE ADOPTION



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.

Yes

Australia
Canada
Cyprus
Estonia
Finland
France
Germany* (2)
Israel
New Zealand (3)
Peru*
Taiwan
United States

No

Argentina
Brazil (2)
Chile
Colombia
Denmark
Germany* (2)
Luxembourg
Mexico
Norway
Peru*
Thailand
United Kingdom

Don't know

Canada
Netherlands
Slovakia

* 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

Red Nacional de Salud Digital <https://www.argentina.gob.ar/salud/digital/red>
Standards (FHIR mentioned) <https://www.argentina.gob.ar/salud/digital/estandares>
Implementation Guide <https://guias.hl7.org.ar/site/index.html>
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>) 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>

Standards adoption in Digital Health Interoperability is a complex endeavour in Canada. Multiple standards are considered together in the design of pan-Canadian 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. 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

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-secur-vague-1>

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

<https://www.tewhatauora.govt.nz/our-health-system/digital-health/hira-connecting-health-information>

<https://www.tewhatauora.govt.nz/our-health-system/digital-health/health-information-standards/approved-standards/>

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

<https://www.gob.pe/institucion/minsa/normas-legales/277209-464-2019-minsa>

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

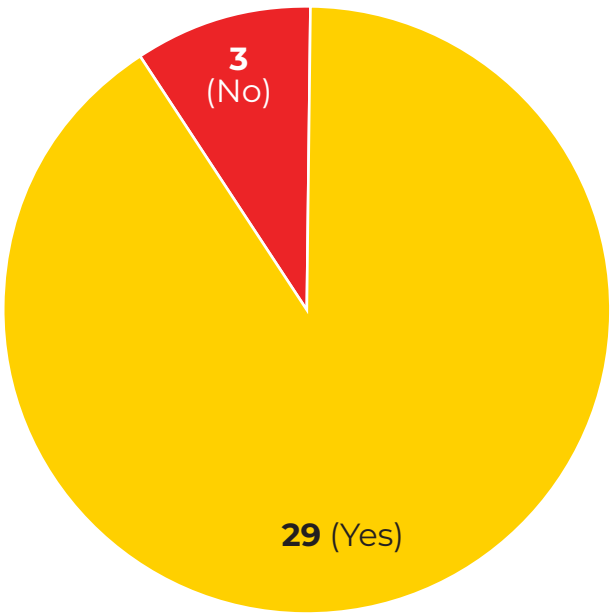
Healthcare policy in the UK tends to be led by the NHS (with governmental oversight), who have some advisory standards, but little that is mandated. FHIR standards (UK Core) are in draft.

United States

LEAP Grants (<https://www.healthit.gov/topic/onc-funding-opportunities/leading-edge-acceleration-projects-leap-health-information>), TEFCA (<https://www.healthit.gov/topic/interoperability/policy/trusted-exchange-framework-and-common-agreement-tefca>), ONC/HL7 Cooperative Agreement

ONC Certifies Health IT. Other agencies (CMS, CDC, etc.) require the use or provide monetary incentives.

NATIONAL STANDARDS



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.

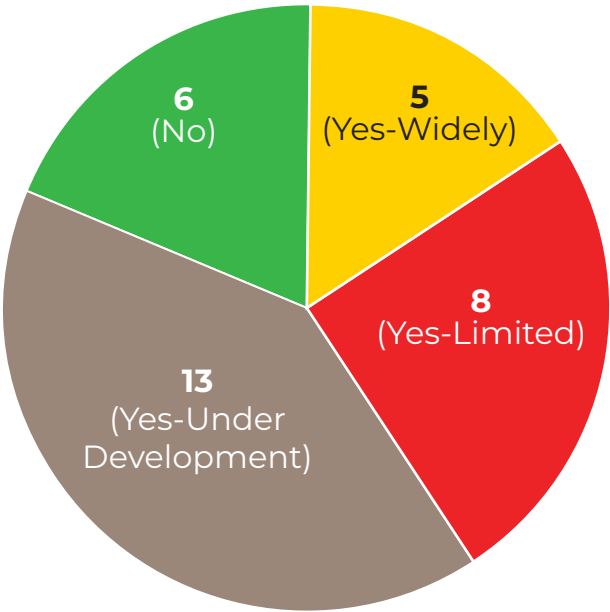
Yes/Name of organization

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	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)

Finland	HL7 Finland
France	InteropSanté & ANS
Germany	
Germany	KBV; gematik
Germany	DIN
Luxembourg	Agence eSanté
Mexico	Asociación para la promoción de la interoperabilidad en salud (APIS)
Netherlands	Nictiz
New Zealand (3)	Health Information Standards Organisation (HISO)
Norway	Directorate of eHealth has the mandate to recommend or require standards for health in Norway
Peru*	Ministry of Health of Peru
Slovakia	Slovak National Health Information Centre
Taiwan	MOHW funds for PMO yearly. PMO can be run by any organization(s).
Thailand	1) Thai Health Information Standards Development Center 2) Strategy and Planning Division, Ministry of Public Health
United Kingdom	HL7 UK
United States	Office of the National Coordinator for Health IT
No	
Germany*	
Israel	
Peru*	

* contradiction

FHIR DATA MODEL



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
Germany* (2)	https://simplifier.net/basisprofil-de-r4
Netherlands	https://simplifier.net/nictizstu3-zib2017 , https://simplifier.net/nictiz-r4-zib2020
United States	USCDI (https://www.healthit.gov/isa/united-states-core-data-interoperability-uscdi#uscdi-v3) + US Core (http://hl7.org/fhir/us/core/STU6/)

Yes, it is being used in a limited set of use cases

Argentina	https://bus.msal.gob.ar/fhir/ar/core/site/index.html
Denmark	https://docs.ehealth.sundhed.dk/
Germany*	https://simplifier.net/Basisprofil-DE-R4 ; https://simplifier.net/base1x0
New Zealand	https://simplifier.net/organization/nz-fhir-registry
New Zealand (2)	https://fhir.org.nz/ig/base/index.html
Norway	
Taiwan	https://twcore.mohw.gov.tw/ig/ ; https://dccfhirig.mohw.gov.tw/ig/index.html

Yes, it is under development

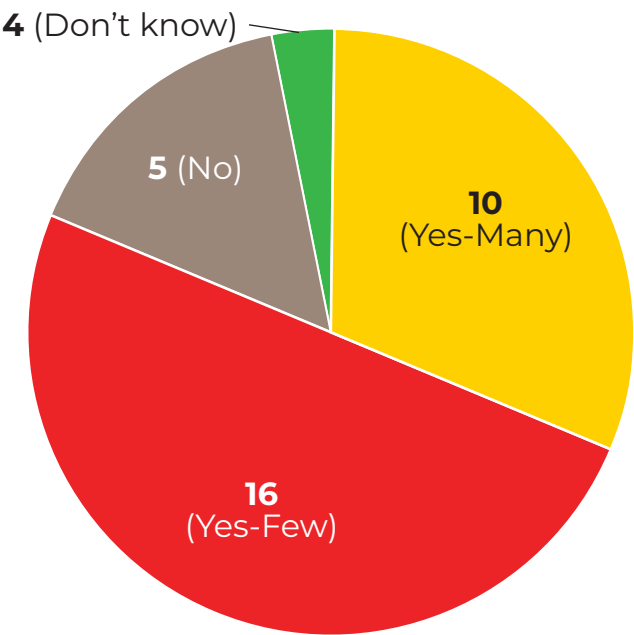
Australia	https://build.fhir.org/ig/HL7au/au-fhir-core/
Brazil	simplifier RNDs
Brazil	https://rnds-guia.prod.saude.gov.br/docs/rel/mi-rel/
Canada	The pan-Canadian FHIR data model for Patient Summary domain was published in 2022. The CA Core+ is currently under development - which will provide FHIR data 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	
Cyprus	https://simplifier.net/ehealth4u
Estonia	https://simplifier.net/guide/ee-fhir-base?version=current
Finland	fhir.fi
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

FHIR USE CASES

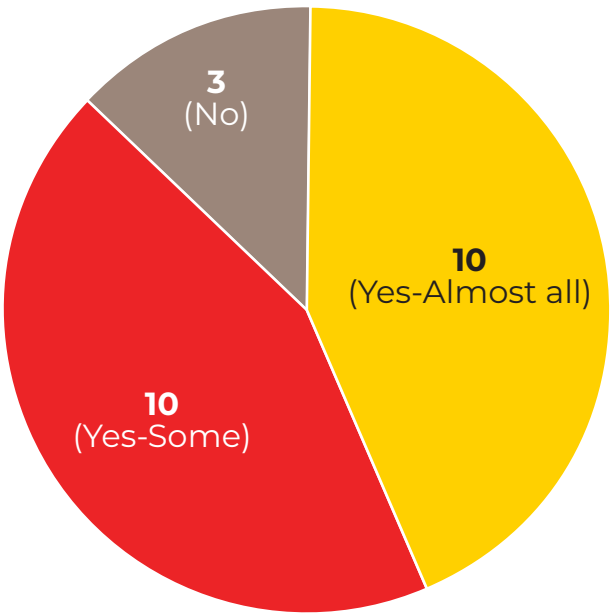


Q. Are there any other FHIR standards developed in [your country] for more specific use cases?

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	Yes, a few	No
Canada (2)	Argentina	Cyprus
Finland	Australia	Mexico
France	Brazil (2)	Peru
Germany (4)	Chile	Slovakia
Netherlands	Colombia	United Kingdom
United States	Denmark	
	Estonia	
	Israel	
	Luxembourg	
	New Zealand (3)	
	Norway	
	Taiwan	
	Thailand	
		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.

Yes, (almost) all of them	Yes, some of them	No
Argentina	Australia	Brazil*
Colombia	Brazil*	Canada*
France	Canada*	Finland
Germany* (3)	Denmark	
Israel	Estonia	
Netherlands	Germany*	
New Zealand	New Zealand* (2)	
United States	Norway	
	Taiwan	

* 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-CI that is starting to be used by the government and echosystem.

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_\(Main_Page\)](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.

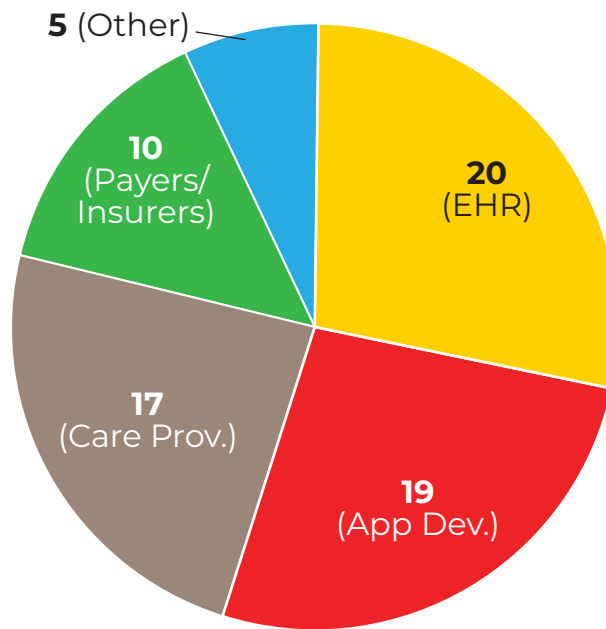
United Kingdom

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 IS ADOPTING FHIR



Q. 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:

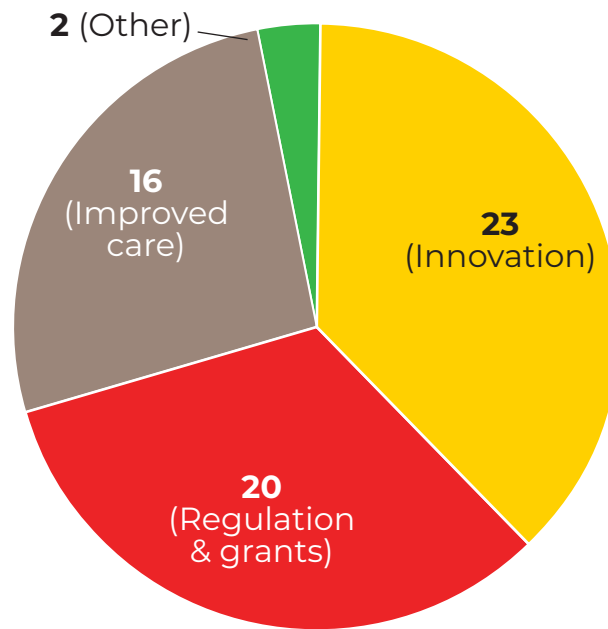
- 1 - Health Information Systems, Jurisdictional Assets/Repositories
- 2 - National services
- 3 - eHealth agency
- 4 - Researchers
- 5 - Some companies, hospitals, HIT vendors, etc.

WHO IS ADOPTING FHIR (con't)

	EHR VENDORS	APP DEVELOPERS	CARE PROVIDERS	PAYERS / INSURERS	OTHER
Argentina			X	X	
Australia	X	X	X	X	
Brazil			X	X	
Brazil			X		
Canada	X	X			1
Canada	X	X			
Chile		X	X		
Colombia	X	X	X	X	
Cyprus	X	X	X	X	
Denmark	X				
Estonia	X				
Finland	X	X	X		2
France	X	X		X	3
Germany	X	X	X	X	
Germany	X	X		X	
Germany	X	X		X	
Germany		X			
Israel			X		
Luxembourg	X	X			
Mexico	X				
Netherlands	X	X	X		4
New Zealand	X	X	X		
New Zealand	X	X			
New Zealand		X			
Norway	X				
Peru		X	X		
Peru			X		
Taiwan					5
Thailand			X		
United Kingdom	X		X		
United States	X	X	X	X	

- 1 - Health Information Systems, Jurisdictional Assets/Repositories
- 2 - National services
- 3 - eHealth agency
- 4 - Researchers
- 5 - Some companies, hospitals, HIT vendors, etc.

PRIMARY DRIVERS OF FHIR ADOPTION



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

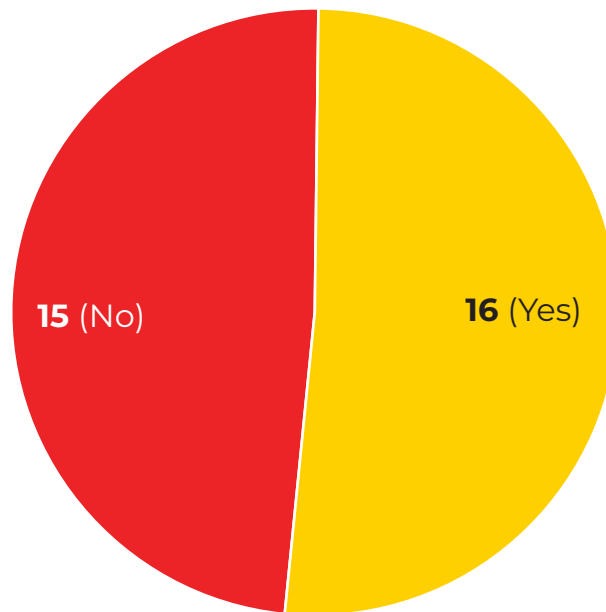
PRIMARY DRIVERS OF FHIR ADOPTION (con't)

	INNOVATION	REGULATION AND GRANTS	IMPROVED CARE	OTHER
Argentina			X	
Australia	X		X	
Brazil	X			
Brazil	X			
Canada	X	X	X	1
Canada		X	X	
Chile	X			
Colombia	X		X	
Cyprus	X	X	X	
Denmark	X			
Estonia	X	X		
Finland	X		X	2
France	X		X	
Germany	X	X		
Germany		X		
Germany		X		
Germany		X		
Israel	X	X	X	
Luxembourg	X	X	X	
Mexico	X			
Netherlands	X	X		
New Zealand	X	X	X	
New Zealand	X		X	
New Zealand	X			
Norway			X	
Peru		X		
Peru		X		
Slovakia		X		
Taiwan	X	X		
Thailand		X		
United Kingdom	X	X	X	
United States	X	X	X	

1 - Improved data analytics and reporting to support care delivery improvements

2 - Easy to implement

PATIENT ADVOCACY



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?

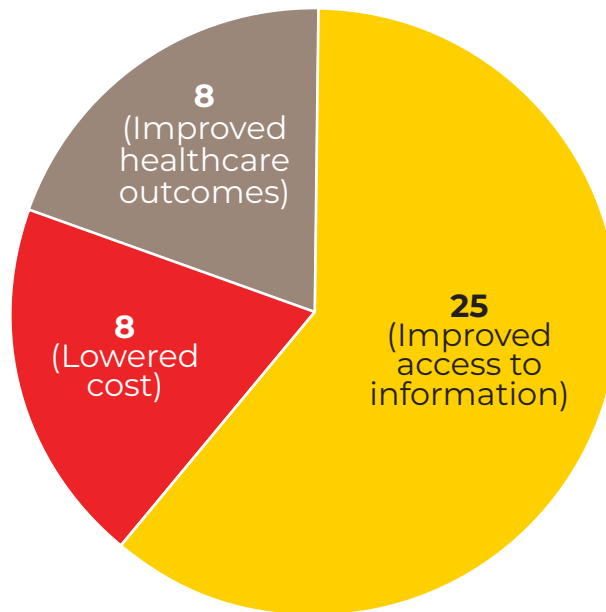
There was an even split between the respondents when asked if they were aware of patient advocacy for the availability of healthcare data in their countries. Among those who were aware, 9 said the patient advocacy groups specifically pay attention to health data standards and 5 said they did not. Respondents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

PATIENT ADVOCACY (con't)

YES-AWARE OF PATIENT ADVOCACY	ADVOCACY GROUP(S) PAY ATTENTION TO STANDARDS	PATIENT ADVOCACY GROUP(S)
Argentina	No	
Australia	No	
Canada	Yes, but not including FHIR specifically	HealthCareCAN
Canada	Yes, but not including FHIR specifically	Patient advocacy is both Government and grass roots supported
Chile	No	Agrupacion de Pacientes de Chile, Grupo de Cyberseguridad de Pacientes
Colombia	Yes, including FHIR specifically	Committee of patients of HL7 Colombia, Pacientes Colombia
Cyprus	No	Cyprus Federation of Patients' Associations
Denmark	No	Danske patienter
Estonia	No	Patient organisations
Germany*	Yes, but not including FHIR specifically	
Germany*	Yes, including FHIR specifically	
Mexico	Yes, but not including FHIR specifically	Accountability lab
Netherlands	Yes, but not including FHIR specifically	Patiëntenfederatie Nederland/ Dutch Patient Federation
New Zealand	Yes, but not including FHIR specifically	Whānau, Consumer and Clinician Digital Council
New Zealand	Yes, but not including FHIR specifically	https://www.waikatodhb.health.nz/patients-and-visitors/support/patient-advocates/
Peru	No	
NO - UNAWARE OF PATIENT ADVOCACY GROUP(S)		
Brazil (2) Finland France Germany (2)	Israel Luxembourg New Zealand Norway	Peru Slovakia Taiwan Thailand United Kingdom

* contradiction

SUCCESSFUL FHIR USE CASES



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)

	IMPROVED ACCESS TO INFORMATION	LOWERED COST	IMPROVED HEALTHCARE OUTCOMES
Argentina	X	X	
Australia	X	X	
Brazil	X		
Brazil	X	X	X
Canada	X	X	X
Canada	X		
Chile	X		X
Colombia	X	X	X
Cyprus	X		
Denmark	X		
Estonia	X		X
Finland	X	X	
France	X		
Germany	X		X
Germany	X		
Germany	X		
Germany			X
Israel	X		
Netherlands	X		X
New Zealand	X		
New Zealand	X		
New Zealand	X	X	
Norway	X	X	
Thailand	X		
United Kingdom	X		
United States	X		

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, Verordnungssoftwareschnittstelle, 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://marketplace.hira.health.nz/apis>

<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>

New Zealand

<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>

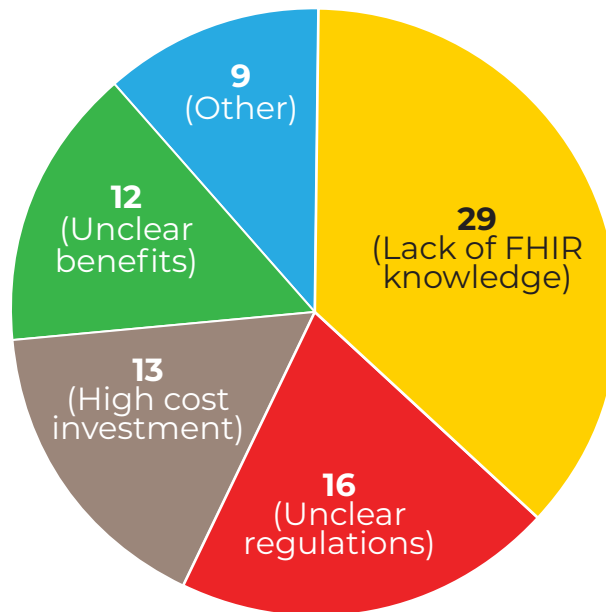
United Kingdom

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

CHALLENGES TO ADOPTING FHIR



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)

	HIGH INVESTMENT COST	UNCLEAR BENEFITS	UNCLEAR REGULATION	LACK OF FHIR KNOWLEDGE	OTHER
Argentina			X		
Australia			X	X	
Brazil		X	X	X	
Brazil		X	X	X	
Canada				X	1
Canada	X		X	X	
Chile			X	X	
Colombia			X	X	2
Cyprus				X	3
Denmark	X	X	X	X	
Estonia				X	
Finland				X	4
France	X	X		X	
Germany	X			X	
Germany	X	X	X	X	
Germany	X			X	5
Germany				X	
Israel	X				6
Luxembourg	X			X	
Mexico		X	X	X	7
Netherlands	X	X	X	X	8
New Zealand		X			
New Zealand				X	
New Zealand			X	X	9
Norway			X	X	
Peru	X	X	X	X	
Peru		X	X	X	
Slovakia	X			X	
Taiwan	X			X	
Thailand		X	X	X	
United Kingdom	X			X	
United States		X		X	

- 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

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:**

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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.