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INTEROPERABILIDAD REGIONAL EN SALUD DIGITAL

CONECTATON

PH4H

GLOBAL REPORT

PH4H Connectathon 2025

Technical Support

RACSEL

LATIN AMERICA AND CARIBBEAN DIGITAL HEALTH NETWORK

27-30, Octubre
San Salvador, El Salvador

OPS

BID

Collaborators:

Introduction

The fourth **regional PH4H Connectathon,** took place from October 27 to 30, 2025, in San Salvador, El Salvador, as part of the event “Driving Innovation and Connection in the Americas. Regional Meeting + 4th Connectathon”. This year's event continued to support the development of the **Pan-American Highway for Digital Health (PH4H)**, which was officially launched in 2024.

PH4H is a regional initiative led by the Inter-American Development Bank (IDB), the Pan American Health Organization (PAHO), and countries in Latin America and the Caribbean (LAC). PH4H seeks to ensure that people can securely access their health data and services from anywhere in the region. The initiative promotes system interoperability and the exchange of information within and between countries to enhance care and strengthen the region's health systems.

Participants of the PH4H Connectathon, representing the Ministries of Health of 17 countries in the region, worked on two tracks: **cross-border continuity of care** and **digital vaccination certificates.**

Fig. 1: The 17 participating countries in the 2025 Connectathon

About the PH4H Connectathon: Framework and Process

The Connectathon, an interoperability marathon for health systems in a testing environment, aims to equip countries with the necessary enablers for a future move to production. The complete process was organized into two main components:

Component 1: Pre-Connectathon
A comprehensive preparatory phase where countries deployed systems, prepared national platforms, configured infrastructure, received training, conducted testing, and developed technical solutions. This foundation ensured all participants had the necessary capabilities for cross-border interoperability testing.

Component 2: Connectathon Execution
This main event consisted of two implementation stages:

- Phase 1 - Virtual Preparation: During this phase, countries created test patients in their systems and generated and persisted both international patient summary (IPS[1]) documents and digital vaccination certificates (ICVP[2]) within their national infrastructure, preparing them for subsequent peer-to-peer exchange.
- Phase 2 - In-Person Testing: Countries gathered in San Salvador to execute peer-to-peer exchanges using the mobile apps and proof of concept wallet, scanning QR codes, and validating cross-border interoperability in real-time.

[1] IPS - International Patient Summary: https://build.fhir.org/ig/HL7/fhir-ips/.
[2] ICVP - International Certificate of Vaccination or Prophylaxis: https://smart.who.int/icvp/

This structured approach ensured systematic progression from foundational system setup to complex cross-border validation scenarios, as illustrated in the diagram below:

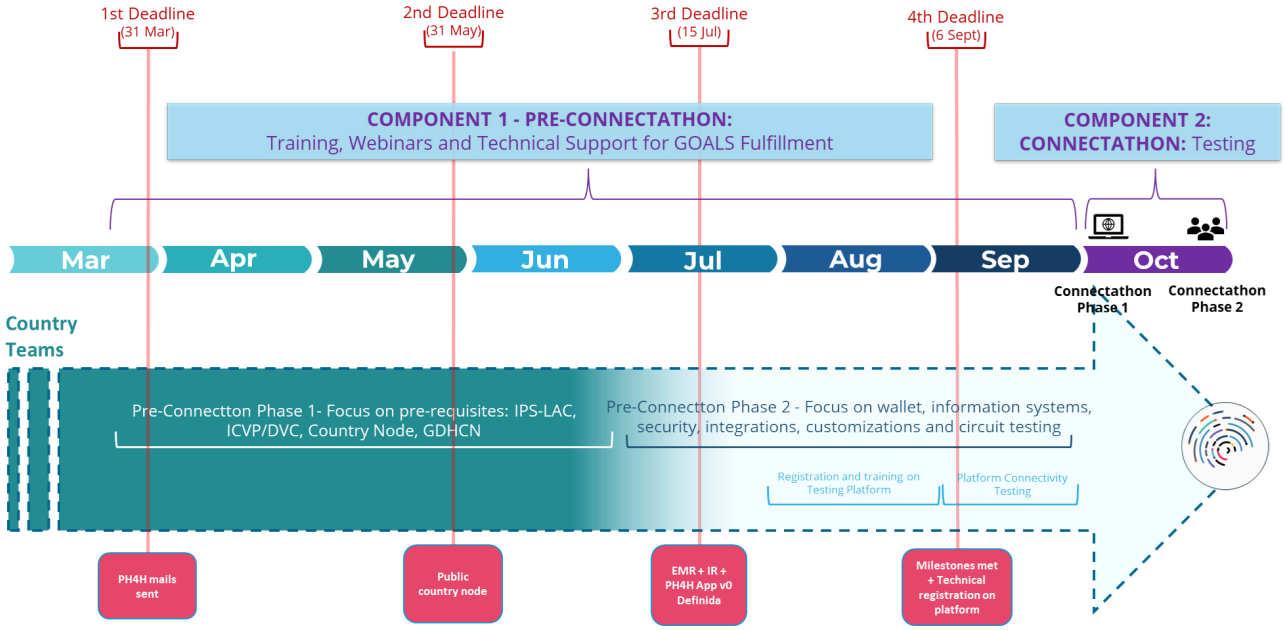

Fig. 2: 2025 Pre-Connectathon and Connectathon process

For further details regarding the framework and process, please refer to **Appendix 1**.

Event Evolution in Figures

The PH4H Connectathon has established itself as the central technical proving ground for digital health interoperability in the Latin American and Caribbean region. From its inception, the event has experienced substantial growth in scale, scope, and complexity, as detailed in the comparative data below. This evolution underscores its pivotal role in maturing the region's capacity for secure cross-border health data exchange.

	LACPASS Connectathon 2022	LACPASS Connectathon 2023	PH4H Connectathon 2024	PH4H Connectathon 2025
Participating countries	8	16	17	17
Number of monitors	5	11	12	11
Profiles Tested	1	4	5	7
Tests executed across tracks	83	403	380	712

Table 1: Comparison of LACPASS and PH4H Conectathon (2022-2025)

The table illustrates the evolution of the LACPASS/PH4H Connectathons from 2022 to 2025:

- **Participating countries:** The number of countries doubled from 8 in 2022 to 16 in 2023 and slightly increased to 17 in 2024 and 2025, reflecting the continued expansion of regional cooperation.
- **Number of monitors:** Monitors increased from 5 in 2022 to 11–12 between 2023 and 2025, showing strengthened technical support and supervision of the tests.
- **Profiles tested:** The number of profiles tested grew from 1 in 2022 to 7 in 2025, indicating more complex interoperability scenarios and broader coverage of use cases.
- **Tests executed across tracks:** The total number of tests rose sharply from 83 in 2022 to 712 in 2025, reflecting the increase in participating countries, the number of profiles, and the overall complexity of the tests conducted.

In summary, these figures show significant and sustained progress in participation, technical depth, and operational scale, highlighting the Connectathon's central role in advancing and stress-testing the digital health interoperability framework for Latin America and the Caribbean.

PH4H Connectathon 2025 Results

During the 2025 PH4H Connectathon, the participating countries tested their ability to implement and validate different tracks with their national systems in a dedicated testing environment, evaluating their interoperability and compliance with international standards. The testing was conducted through both virtual (Phase 1) and in-person (Phase 2) sessions, where countries used mobile applications to store and share QR codes for both VHL[3] and ICVP documents.

Regional Performance Overview:

- **Track 1:** 70% of the 17 participating countries (12 countries) successfully completed and validated all test cases in Track 1 with their national systems during the in-person phase. The remaining 30% (5 countries) were unable to complete the full set of required tests.
- **Track 2:** Track 2: 35% of the participating countries (6 countries) successfully completed and validated all test cases in Track 2. 65% (11 countries) faced challenges in completing the full validation process.

Test completion progress: The following figure illustrates the average percentage of completed tests versus the total number of tests executed for the entire region and for each subregion. This metric shows the overall progress in achieving interoperability milestones, regardless of whether countries completed the entire track.

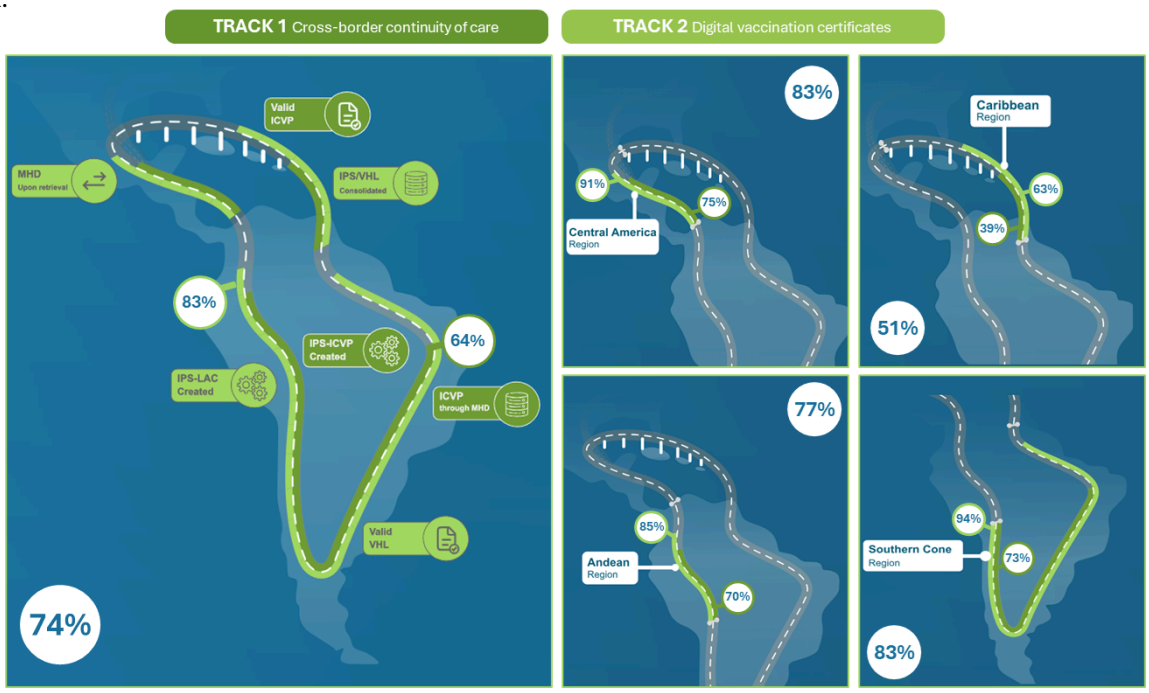

Fig. 3: 2025 Milestones achievement percentages by subregion

[3] VHL - Verifiable health links https://build.fhir.org/ig/IHE/ITI.VHL/volume-1.htm I

Results by Subregion:

Below is the list of countries that participated in each subregion:

- **Southern Cone**: Argentina, Brazil, Chile, Paraguay, Uruguay.
- **Andean Region**: Ecuador, Perú.
- **Central America**: Costa Rica, El Salvador, Guatemala, Honduras, Panamá.
- **Caribbean**: Bahamas, Barbados, Belize, Dominican Republic, Suriname.

The following table shows the distribution of the results by subregion:

Subregión	Phase 1 & 2 Total number of tests (Track 1 and Track 2)	Phase 1 & 2 Total number of successful tests (Track 1 and Track 2)	Phase 1 % of countries that successfully completed Track 1	Phase 1 % of countries that successfully completed Track 2	Phase 2 % of countries that successfully completed Track 1	Phase 2 % of countries that successfully completed Track 2
Southern Cone	267	245	100%	100%	100%	40%
Andean Region	114	105	100%	100%	100%	50%
Central America	172	159	100%	100%	60%	60%
Caribbean	159	117	100%	100%	40%	0%

Table 2: Results by Subregion

The data reveals distinct patterns of progress and challenge across the subregions. While all subregions demonstrated strong foundational capabilities by achieving 100% completion in the virtual Phase 1 for both tracks, their performance diverged during the in-person, cross-border validation of Phase 2. This variation highlights differences in technical readiness and the complexity of implementing live, peer-to-peer exchanges for digital health documents. The results provide a clear regional diagnostic, identifying both areas of collective strength and specific interoperability challenges that require targeted support in the ongoing development of the PH4H.

Results and Conclusions

The regional PH4H Connectathon marked a crucial milestone in advancing health interoperability in Latin America and the Caribbean. The event served to continue building the Pan-American Highway for Digital Health: a connected digital health infrastructure that aims to ensure continuity of care across the region.

The participation of 17 countries and the collaboration with key stakeholders highlight the importance of these efforts in strengthening digital health systems. The PH4H is built stretch by stretch, country by country. The results obtained in the two main work areas of the connectathon —Cross-Border Continuity of Care and Digital Vaccination Certificates— reflect significant regional progress, with an 83% completion rate in the continuity of care track and 64% in the vaccination track.

These outcomes underscore the significant strides made in implementing international digital health standards and establishing the technical and procedural foundations necessary for regional data exchange. The progress achieved provides a robust framework for advancing toward full regional digital health integration, while also clearly identifying specific technical and operational areas that will require focused attention and further development in upcoming phases.

Despite the challenges encountered during testing, the Connectathon represented a decisive and collective step forward toward a more interoperable, secure, and accessible digital health ecosystem for the Americas. Although the in-person event has concluded, the collaborative work continues throughout the year. The next regional Connectathon is already scheduled for July 2026 in Panama, marking the next phase in this ongoing journey.

Next Steps: Post-Connectathon

The PH4H Connectathon represents a critical milestone in testing interoperability, but the ultimate goal is the transition to operational production systems. The following steps outline the path forward:

1. Post-Connectathon Action Plan

- **National Roadmaps:** Countries are encouraged to develop national implementation roadmaps based on their connectathon results, prioritizing the resolution of identified technical gaps.
- **Production Readiness Assessment:** Conduct internal evaluations to determine system readiness for production deployment, focusing on security, scalability, and compliance with PH4H standards.
- **Capacity Building:** Continue participation in technical working groups for specific use cases (e.g., Yellow Fever digital certificates, International Patient Summary).

2. Path to Production under the PH4H Framework

- **Trust Framework Integration:** Complete onboarding to the WHO Global Digital Health Certification Network (GDHCN)[4] and establish bilateral/multilateral trust agreements with partner countries.
- **Production System Validation:** Plan and execute controlled pilot exchanges with partner countries using production systems and real patient data (with appropriate consent).
- **Policy Alignment:** Work with national health authorities to align policies and regulations supporting cross-border health data exchange.

3. Preparation for Panama 2026 Connectathon (Starting Q1 2026)

- **System Enhancements:** Implement improvements based on 2025 results, particularly in QR code validation and cross-border document exchange.
- **Expanded Testing:** Prepare for testing additional use cases and more complex interoperability scenarios in the next connectathon.
- **New Participants:** Onboard additional technical team members and institutions to strengthen national capabilities.

The transition from testing to production requires sustained effort and collaboration. The PH4H initiative provides the framework, but national commitment and continuous technical development will determine the success of connected health across the Americas.

[4] GDHCN - https://www.who.int/initiatives/global-digital-health-certification-network

Appendix 1: Connectathon Framework and Process

Component 1: Pre-Connectathon

This stage focused on three main pillars: knowledge dissemination, platform development and deployment, and internal configuration and testing.

Throughout this process, countries received continuous support from specialized technical experts. Each participating team was responsible for preparing and deploying the necessary public infrastructure to implement and test the interoperability standards and profiles defined for each track executed during the connectathon.

Additionally, technical teams from the participating countries were trained on key standards and profiles related to the defined tracks. These included topics such as the HL7 FHIR standard, the International Patient Summary (IPS)[5] profile, the Mobile Health Documents (MHD)[6] profile, Verifiable Health Links (VHL)[7], terminology services, patient master registries, and the International Certificate of Vaccination or Prophylaxis (WHO ICVP)[8]. The phase also involved generating the required keys for the World Health Organization's (WHO) Global Digital Health Certification Network (GDHCN) trust framework, configuring and mapping the terminologies to be used. Finally, countries configured and implemented a digital App and Wallet for the exchange of VHL and ICVP. The training sessions were conducted by the technical team in collaboration with WHO, CENS, Create SpA, SNOMED International, CDPI, Izertis, QoXit, Infoway, and IHE Catalyst. All resources developed and used during the PH4H Connectathon are available at https://racsel.org/conectaton2025/

Lastly, preparatory webinars were held to cover topics such as the use of the testing platform and detailed explanations of the evaluations that would be part of the connectathon.

[5] IPS - International Patient Summary: https://build.fhir.org/ig/HL7/fhir-ips/.
[6] MHD - Mobile health documents: https://build.fhir.org/ig/IHE/ITI.MHDS/branches/master/index.html.
[7] VHL - Verifiable health links https://build.fhir.org/ig/IHE/ITI.VHL/volume-1.htm l
[8] ICVP - International Certificate of Vaccination or Prophylaxis: https://smart.who.int/icvp/

	WEBINAR	Organization
1	HL7 FHIR Fundamentals	RACSEL
2	IPS-LAC	RACSEL
3	IPS Other Implementations	Infoway
4	OPS All in One	PAHO
5	GDHCN	WHO
6	GDHCN Reinforcement* / Onboarding Workshop	CREATE
7	Terminologies I	SNOMED
8	PH4H App Deployment and Onboarding	CREATE
9	Terminologies II	SNOMED
10	Terminologies III	SNOMED
11	Wallet I: General Overview	Izertis
12	ICVP/DVC	CENS
13	PH4H App Features and Interoperability	CREATE
14	National Backend Cybersecurity	IDB - Qoxit
15	Onboard Gazelle Registration webinar	IHE
16	Wallet Frameworks	WHO - CDPI
17	Wallet II: Demo & Hands-on Implementation	Izertis
18	Gazelle Platform webinars	IHE

Table 3: 2025 Pre-Connectathon training sessions.

Component 2: Connectathon

The PH4H Connectathon was structured in two distinct phases to test interoperability systematically:

Phase 1: Virtual Connectathon (Preparation)

During this virtual phase, technical teams focused on creating patient records and persisting International Patient Summaries (IPS) and digital vaccination certificates (ICVP) within their national systems. This foundational work ensured that each country's infrastructure was properly configured and contained the necessary health data for cross-border exchange.

Phase 2: In-Person Event (Execution & P2P testing)

During the face-to-face event in San Salvador, countries executed peer-to-peer exchanges of IPS-LAC and vaccination certificates. Teams conducted interoperability tests on the testing platforms —**IHE Gazelle**[9] and **WHO ITB**[10] (Interoperability Test Bed)—, with the IHE Catalyst team performing the test verification and validation.

[9] IHE Gazelle: https://gazelle.ihe-europe.net/
[10] WHO ITB: https://interoperable-europe.ec.europa.eu/collection/interoperability-test-bed-repository/solution/interoperability-test-bed/news/itb-support-world-health-organization

This phase focused on practical implementation and real-time problem-solving for cross-border health data sharing.

Fig. 5: 2025 Connectathon Testing Room

The connectathon was structured around two technical tracks:

1. Track 1: Cross-Border Continuity of Care:

This track aimed to enable participating countries to generate international clinical information summaries for individuals, based on a standardized dataset aligned with the IPS-LAC[11] international profile. These summaries were made accessible through Verifiable Health Links, facilitating the secure and controlled exchange of health information between individuals and health systems. This approach optimized data mobility and promoted interoperability in the cross-border context.

[11] IPS-LAC IG https://lacpass.racsel.org/

2. Track 2: Digital Vaccination Certificates:

This track focused on enabling participating countries to generate, interoperate, and validate immunization certificates using a standardized dataset based on the WHO's ICVP profile. This approach ensured compliance with international standards and facilitated the seamless exchange and validation of data across borders.

Fig. 6 and 7: PH4H 2025 Connectathon Tracks

Milestones

For each track in the 2025 Connectathon, specific milestones were defined across two phases to measure progress systematically. The achievement of these milestones determined the advancement level for each track in percentage terms, providing a clear assessment of regional and country-level performance.

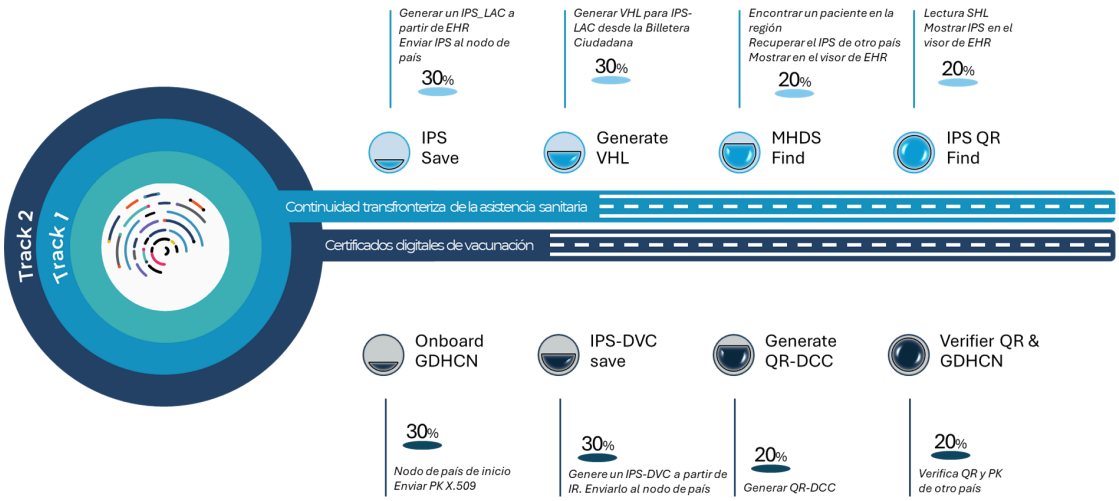

Fig. 8: PH4H 2025 Connectathon Milestones.

Testing framework and methodology

The testing framework was structured around comprehensive validation scenarios, implemented through a collaborative, group-based methodology designed to maximize peer learning and real-time progress tracking.

Group-based implementation

Country teams were organized into five working groups, each composed of 3–4 countries. This structure was designed to facilitate direct peer-to-peer exchange of technical knowledge, data, and validation scenarios within each group, while fostering a collaborative yet results-driven environment.

Progress measurement and engagement

The advancement of each table was measured collectively based on the average milestone completion of its member countries. Progress was displayed in real time during the event through a dynamic ranking dashboard, which promoted transparency, motivation, and friendly competition among the groups. This approach not only accelerated technical validation but also strengthened regional collaboration and problem-solving capabilities.

Track-specific milestones:

Track 1: Cross-Border Continuity of Care

- Phase 1 (Virtual): Countries created and persisted IPS documents (using IPS-LAC profile) with proper terminology mapping and VHL preparation.
- Phase 2 (In-Person): Teams executed cross-border exchanges using the PH4H App[12] or their own national applications (and optional wallets) to store and share QR codes, validating VHL generation, scanning, and creating new consolidated IPS/VHL documents with combined information from multiple countries.

Track 2: Digital Vaccination Certificates

- Phase 1 (Virtual): Countries configured systems for ICVP generation with proper immunization data structure.
- Phase 2 (In-Person): Participants used the provided PH4H App or their own national applications (and optional wallets) to store and share QR codes while validating ICVP generation, scanning, and verification across international borders.

[12] PH4H App: It is a mobile application distributed to participating countries for securely managing and accessing digital health documents.:

The milestone-based approach, combined with the table-group methodology, enabled precise measurement of interoperability capabilities. It successfully highlighted technical achievements, fostered collaborative learning, and identified specific challenges to be addressed in future regional initiatives.

Fig. 9: Working Groups - PH4H Connectathon 2025

Appendix 3: 2025 Connectathon Global Results and Metrics

A total of 712 tests were conducted by 17 countries: 626 tests were successfully verified, 10 were partially and the remaining tests were not fully completed or failed.

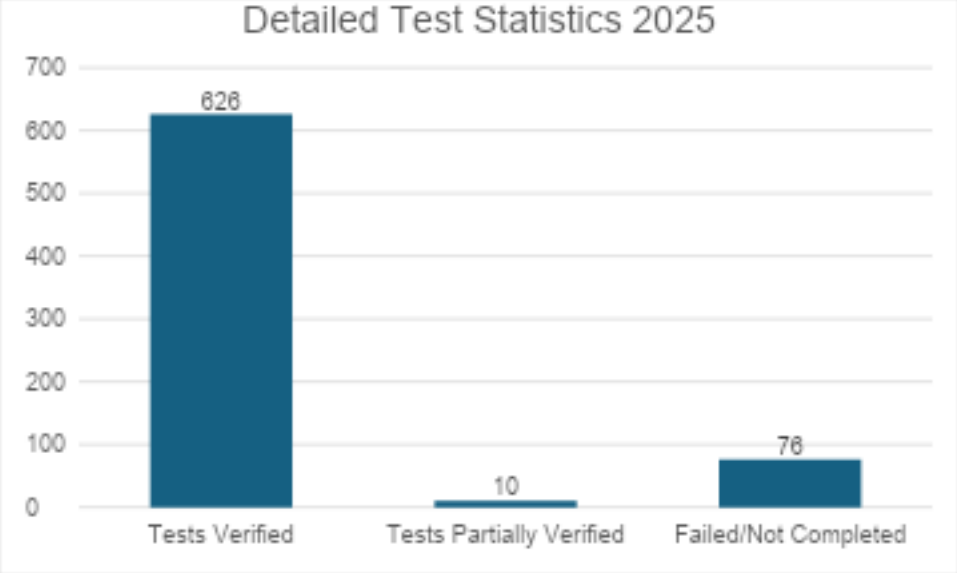

Fig. 10: PH4H - Detailed Test Statistics 2025

Overall Results of Tracks 1 and 2

Metric	Track 1	Track 2
Number of Countries with Success	12	6
Success Rate by Country	70%	35%
Total Number of Tests Executed	502	210

Table 4: 2025 Global Results for Both Tracks

Conditions for Success in Tracks 1 and 2

For each track in the 2025 Connectathon, specific milestones were defined, as shown in the figure below.

Track 1 consisted of 25 tests, and Track 2 consisted of 15 tests. For each track, some tests were mandatory and had to be successfully completed in order to validate the entire track.

Track 1 Conditions for Success

Stage 1: Tests in the Country of Origin

TC Reference	Test	Mandatory Validation Test (Yes/No)
GDCHN Onboarding		No
TC01	MPI ITI-78	No
TC02	SVCM: ITI-98 (Lookup)	No
TC03	SVCM: ITI-101 (Translate)	No
TC04	IPS-LAC valid (EVS Client)	No
TC05	MHD: ITI 65	No
TC06	MHD: ITI 68 from App to FHIR Server	No
TC07	ITB: Validate VHL (VHL shared with App)	Yes
TC08	SCAN VHL in Country B	No

Stage 2: Patient Moves to Country B

TC Reference	Test	Mandatory Validation Test (Yes/No)
TC09	Request/Validate IPS from VHL	Yes
TC10	SVCM: ITI-98 (Lookup)	No
TC11	SVCM: ITI-101 (Translate)	No
TC12	IPS-LAC valid (Country B)	No
TC13	MHD: ITI 65 Country B	No
TC14	VHL* Generation in Country B	No
TC15	EVS Client: CONSOLIDATED IPS (O+B)	Yes
TC16	ITB: Validate CONSOLIDATED VHL (O+B)	Yes
TC17	CONSOLIDATED VHL App to Wallet (Optional)	No

Stage 3: Patient Moves to Country C

TC Reference	Test	Mandatory Validation Test (Yes/No)
TC18	SCAN VHL in Country C	Yes
TC19	Request/Validate IPS from VHL	No
TC20	SVCM: ITI-98 (Lookup)	No
TC21	SVCM: ITI-101 (Translate)	No
TC22	IPS-LAC valid (Country C)	No
TC23	MHD: ITI 65 Country C	No
TC24	VHL* Generation in Country C	Yes
TC25	EVS Client: CONSOLIDATED IPS (O+B) ITB: Validate CONSOLIDATED VHL (O+B)	Yes No
TC26	CONSOLIDATED VHL App to Wallet (Optional)	No

Stage 4: Patient Returns to Country of Origin

TC Reference	Test	Mandatory Validation Test (Yes/No)
TC27	MHD : ITI-67	No
TC28	MHD : ITI-68	Yes

Track 2 Conditions for Success

Stage 1: Tests in the Country of Origin (Connectathon phase 1)

TC Reference	Test	Mandatory Validation Test (Yes/No)
TC01	MPI ITI-78	No
TC02	SVCM: ITI-98 (Lookup)	No
TC03	SVCM: ITI-101 (Translate)	No
TC04	IPS-ICVP valid (EVS Client)	No
TC05	MHD: ITI 65	No

Stage 1: tests in the Origin Country (Connectathon phase 2)

TC Reference	Test	Mandatory Validation Test (Yes/No)
TC06	MHD: ICVP Generation	Yes
TC07	ITB: ICVP QR CODE Validation	Yes
TC08	MHD: ITI 68 from App to Server	No
TC09	ICVP APP to Wallet (Optional)	No

Stage 2: Patient move to the country B

TC Reference	Test	Mandatory Validation Test (Yes/No)
TC10	SCAN ICVP(A) in Country B	Yes
	ITB: ICVP(A) QR CODE Validate	No
TC11	MHD: ITI 65 & ICVP Generation	No
TC12	ITB: ICVP(B) QR CODE Validate	No
TC13	SCAN ICVP(B) using APP (Country B)	Yes
TC14	ICVP(B) APP to Wallet (Optional)	No

Stage 3: Patient Moves to Country C

TC Reference	Test	Mandatory Validation Test (Yes/No)
TC15	ITB: READ and VALIDATE Both ICVPs (A & B)	Yes

Table 5-12: Milestones defined per track.