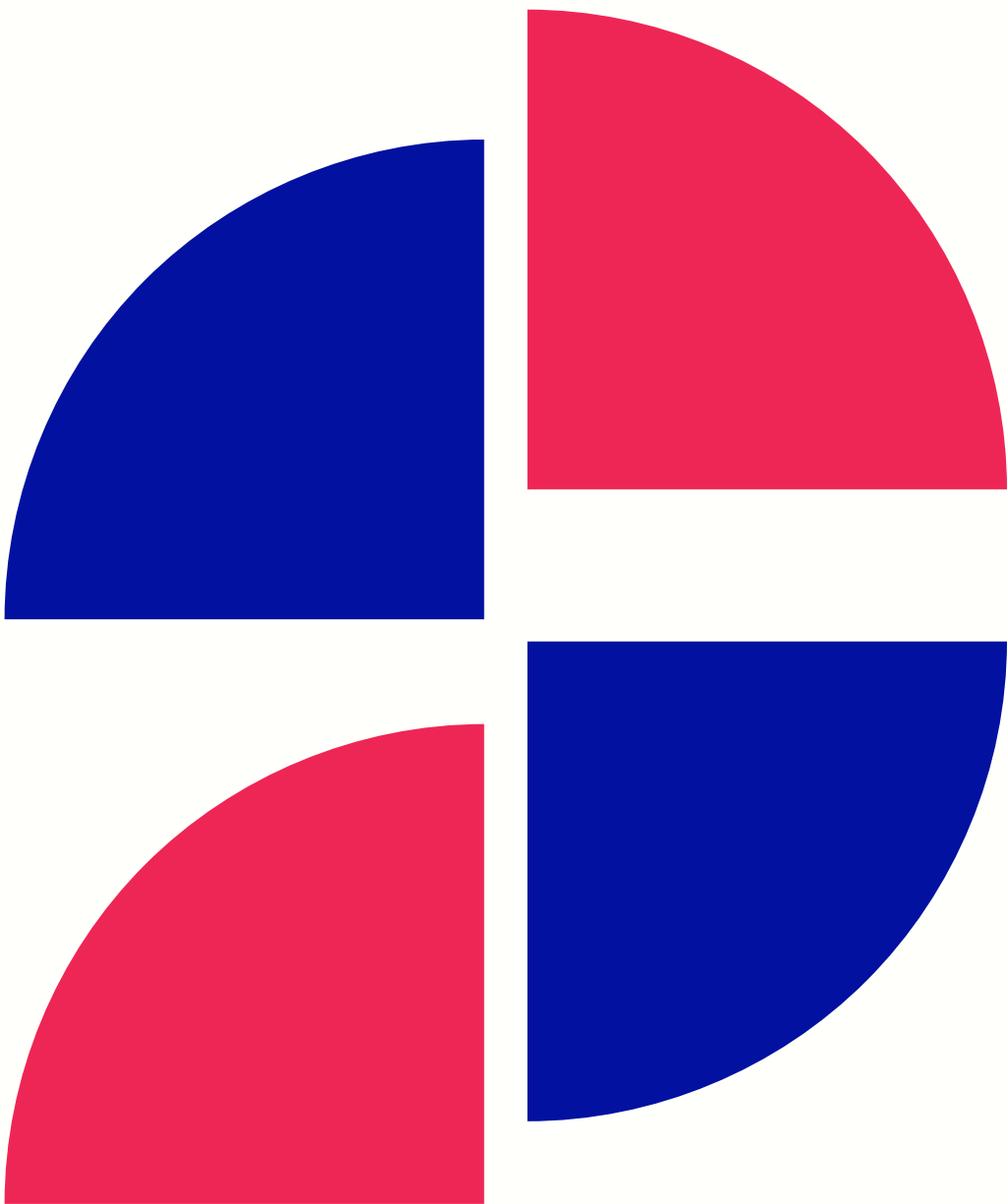
HEALTHTECH HUB

HELINA
Pan African Health Informatics Association

Scaling Interoperability in Africa

Lessons from SIL's First Year

The Standards and Interoperability Lab is helping African health tech teams build interoperable systems.



ABOUT THE PAN-AFRICAN STANDARDS & INTEROPERABILITY LAB (SIL-AFRICA)

SIL-Africa is a regional, multi-sector initiative hosted by HealthTech Hub Africa (HTHA) in Rwanda and governed by HELINA, Africa CDC, country associations, and global partners. Africa's health systems are fragmented, with limited ability to exchange data. SIL-Africa provides the space, expertise, and tools to address this challenge through standards-driven interoperability. SIL operates on four pillars: Teaming, Tooling, Testing, and Training.

THE CHALLENGE

Across Africa, digital health systems (EMRs, surveillance platforms, patient registries, mobile health apps etc) are being built at rapid pace. But many of these systems can't share data with each other. When a patient moves between facilities, their records don't follow. When a government needs aggregated health data for decision-making, systems can't communicate. This isn't a problem of innovation, It's a problem of interoperability: the ability of different systems to exchange and use information seamlessly.

The Pan-African Standards and Interoperability Lab (SIL-Africa), hosted by HealthTech Hub Africa and governed by HELINA, was established to tackle this challenge head-on. Through its four pillars—Teaming, Tooling, Testing, and Training—SIL provides a structured platform for health tech teams, governments, and implementers to build and validate standards-based, interoperable solutions. This case study shares what we learned in SIL's first year of implementation: what worked, what didn't, and what it takes to scale interoperability across diverse contexts.

WHY INTEROPERABILITY MATTERS

When systems can share data:

Patients receive better care because providers have access to complete medical histories.

Governments make smarter decisions using real-time, aggregated health data.

Resources are used more efficiently because solutions can be reused instead of rebuilt from scratch.

Digital health investments scale faster because systems are designed to work together rather than in silos.

Building interoperable systems requires more than good intentions. It requires standards, tools, testing environments, and skilled teams, which is precisely what SIL was designed to provide.

WHAT ENABLED SUCCESS

SIL's first year revealed four critical enablers for scaling interoperability:

1. Teaming: Building Cross-Functional Collaboration

What worked:

- Bringing together technical developers, domain experts (clinicians, informaticians), and policymakers created shared understanding and reduced resistance to standards-based approaches.
- Structured mentorship helped teams transition from proprietary, tightly coupled systems to FHIR-based architectures.

Key insight: Interoperability, besides being about technology, is also about alignment. When domain experts and developers collaborate on FHIR mapping, the quality and consistency of implementations improve significantly.

2. Tooling: Simplifying Technical Complexity

What worked:

- Providing practical, pre-configured tooling (FHIR servers, FHIR API postman collection examples and an Interoperability Test Bed) with step-by-step setup guidance reduced the learning burden.
- Hands-on support in configuring development environments, interpreting tool outputs, and debugging errors helped teams overcome technical barriers.

Key insight: Teams needed support not just in using the tools, but in understanding what the tools were telling them. Without guidance, validation reports and error logs remained opaque therefore slowing implementation down.

3. Testing: Validating Before Deploying

What worked:

- Access to pre-configured sandbox environments and conformance testing tools (Interoperability Test Bed, and FHIR servers) allowed teams to validate implementations iteratively.
- Guided troubleshooting sessions helped teams translate test results into actionable fixes, reducing time to pass validation checks.

Key insight: Testing shouldn't happen at the end, it should be continuous. Teams that tested early often found and fixed issues faster, building confidence along the way.

4. Training: Building Competence Through Practical Application

What worked:

- Structured, phased capacity-building sessions introduced interoperability standards progressively (Base FHIR resources → custom profiles → Implementation Guides).
- Practical exercises mapping Minimum Data Sets (MDS) from legacy systems to FHIR resources, using real-world examples, reinforced technical skills.
- Training on the business value of interoperability helped teams understand why standards matter, not just how to implement them.

Key insight: Theory alone doesn't stick. Teams learned fastest when working through real problems, mapping their own data, troubleshooting their own errors, and seeing how standards apply to their actual use cases.

WHAT DIDN'T WORK (AND WHAT WE'RE FIXING)

SIL's first year also surfaced persistent challenges.

1. T**he Dual Learning Burden**

Teams had to learn both FHIR authoring tools (such as FHIR Shorthand i.e. FSH) and the supporting tooling (FHIR Servers & Interoperability test platforms) and at the same time understand the underlying data models (FHIR resources, profiles, extensions). For teams that were new to interoperability, learning all these components created significant cognitive overload.

.

Solution for 2026

Introduce the tools in a gradual and structured manner. Begin with a high-level overview of OpenHIE principles, followed by a broader introduction to interoperability concepts. Next, engage participants in simple FHIR mapping exercises before introducing FHIR authoring tools. Additionally, provide clearer, simplified documentation and practical templates to support learning and implementation.

2. **Misinterpreting Tool Outputs**

Validation reports and error logs often confused teams, leading to incorrect implementations. Without mentorship, teams struggled to understand *why* tests failed and *what* needed fixing.

Solution for 2026

Provide annotated examples of common validation errors and their fixes. Increase hands-on mentorship during testing phases.

3. **Perception of Duplicated Effort**

Some teams felt that building FHIR-based interoperability layers on top of existing systems was unnecessary duplication.

Solution for 2026

Emphasize FHIR facades as a low-risk, incremental approach. Teams don't need to rebuild their systems—they can expose FHIR-compliant APIs alongside existing interfaces, enabling interoperability without disrupting current workflows.

4. **Limited Awareness of the Business Case**

Many teams asked, "Why do we need standards? Our system works fine."

Solution for 2026

Lead with use cases and pain points. Show how interoperability solves real problems (e.g., fragmented patient records, inability to aggregate data for national reporting, vendor lock-in). Make the "why" clear before diving into the "how."

KEY LESSONS FOR SCALING INTEROPERABILITY

Based on SIL's first year, we learnt a number of things about scaling standards-based digital health

1

Mentorship Accelerates Adoption
Teams moved faster and gained confidence when they had access to structured, ongoing mentorship. Demystifying FHIR through practical application instead of theory alone was the difference between stalled and successful implementations.

2

Domain Expertise and Technical Skills = Better Implementations
Accurate FHIR mapping requires close collaboration between clinicians/informaticians (who understand the data) and developers (who build the systems). When both perspectives are involved, implementations are more consistent and reusable.

3

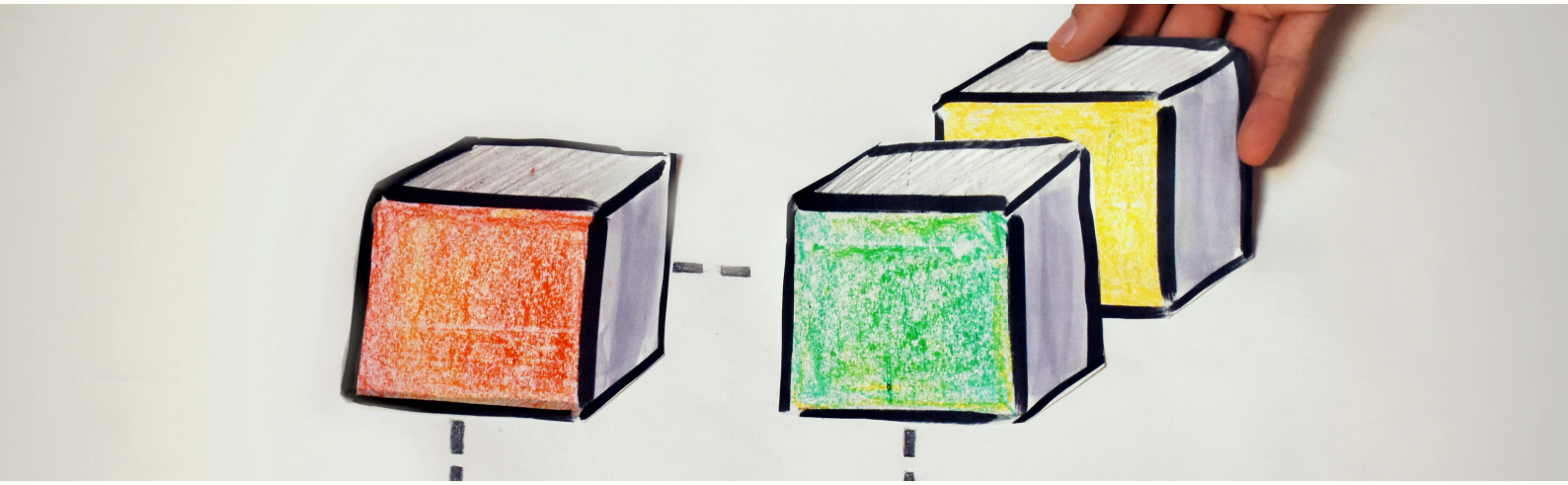
Start Small, Iterate Often
Gradual introduction of interoperability (starting with FHIR facades, then expanding) reduced resistance and allowed teams to adopt standards in manageable, low-risk steps.

4

Standards Prevent Common Mistakes
Without clear guidance, teams overused extensions or misused FHIR resources. Providing design principles and mapping guidelines promoted reuse of standard resources and more interoperable implementations.

5

Regular Review Builds Autonomy
Teams that participated in ongoing review sessions and mentorship progressively required less external support. They built competence and confidence, enabling them to handle FHIR mapping and interoperability challenges independently over time.



LOOKING AHEAD

SIL's first year demonstrated that scaling interoperability is possible but it requires intentional design, sustained mentorship, and practical support. To ensure that the lessons from the SIL implementation translate into sustained impact and scalable interoperability outcomes, the following next steps are recommended:

1. **Strengthen Testing and Certification Mechanisms**
   Expand pre-configured sandbox environments and conformance testing platforms, broaden available test cases beyond the current IPS implementation, and introduce staged conformance levels that guide teams from basic FHIR resource compliance through profile conformance to full end-to-end interoperability testing.

2. **Develop and Share Reusable Technical Assets**
   Publish sample use cases, test data, validation scripts, and reference examples for common scenarios such as IPS, immunization, and referrals to accelerate onboarding, reduce duplication of effort, and enable teams to build on proven technical foundations.

3. **Strengthen Mentorship and Community Support**
   Formalize cross-country knowledge exchange forums under the SIL Africa Community of Practice, document frequently encountered implementation challenges and their resolutions in a shared knowledge base, and establish structured mentorship pathways to support teams as they transition toward independent implementation.

4. **Build Sustainable Capacity Pipelines Through Training**
   Develop tiered training curricula aligned to different levels of expertise starting from foundational interoperability concepts through intermediate profiling and mapping to advanced architecture design and governance while also training non-technical stakeholders on the business value of interoperability and standards-based approaches.

Interoperability is foundational. As Africa accelerates its digital health transformation, the question isn't whether to adopt standards, rather, how to do it well, at scale, and sustainably. SIL's first year showed that with the right support through mentorship, tools, testing environments, and training, teams can build systems that work together, not in silos.