Deliverable D5.1 — Service Deployment and Improvement Plan on IT Development

Work Package 5 — IT Systems Development

Deliverable: D5.1 — *Service Deployment and Improvement Plan on IT Development*
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1. Background and System Objectives

In the initial phase of the ISNSS project, a key priority has been the development of disease-specific workflows and the improvement of integration between laboratory systems and clinical data collection for notifiable diseases subject to mandatory registration.

Currently, physicians collect additional data from patients manually during consultations, which is submitted to the Directorate of Health (DOHI) via Signet transfer. These physician-initiated notifications are then manually reviewed and entered into *Stiki*, the internal surveillance database used for processing such cases. This manual workflow requires staff to validate each submission and assign it to the appropriate case process — a method that is time-consuming, fragmented, and prone to delays.

One of the core objectives of the new system architecture is to phase out manual case handling, replacing it with an automated and unified case registration process. In the proposed model, both laboratory-initiated notifications and physician-submitted notifications will be automatically linked to a unique case ID, ensuring that all relevant information is integrated into a single case record to support coordinated surveillance and follow-up.

To streamline data collection, the project team aims to implement digital, standardized, and secure questionnaires completed by physicians. These questionnaires will be accessed through *Saga* (the national electronic health record system) or via a secure redirect to the new surveillance platform. The content of the questionnaires is being categorized by disease group to ensure clinical relevance and alignment with surveillance needs.

Additionally, challenges have been identified in the current method for assigning ICD-10 codes to notifiable diseases. At present, nightly batch processes extract diagnostic data from the national laboratory information system and transmit it to DOHI. However, physicians are often required to retroactively complete missing information without receiving active prompts or notifications. This can lead to delayed responses, retrospective documentation errors, and incomplete case records.

To address this, a proposed improvement involves triggering a reminder or notification when a relevant questionnaire is associated with a case, either via the physician's workspace in the e-health system or through a secure redirect to the new surveillance platform.

2. Questionnaire Design and Disease Groups

Work is underway to categorize diseases subject to registration into structured implementation phases, allowing for the gradual introduction of standardized electronic questionnaires tailored to

specific disease groups. These questionnaires are designed to support the physician notification process and, in later stages, to facilitate contact tracing and public health follow-up.

Each questionnaire collects structured information drawn from one or more of the following sources:

- Physicians, during consultations or follow-up encounters; Electronic health record systems (e.g., *Saga*) and/or national electronic registries.

When a questionnaire is triggered for a notifiable disease, the physician responsible is prompted to complete the form within the e-health system or through a secure redirect to the new surveillance platform. The collected data are then automatically linked to the corresponding case record, ensuring consistency between laboratory notifications, clinical information, and registry data.

The implementation will follow a staged rollout plan, beginning with selected disease groups and expanding progressively based on disease characteristics, system readiness, and clinical feasibility. The current structure includes:

- Sexually Transmitted Infections (and related conditions)
- Vaccine-Preventable Diseases
- Gastrointestinal Infections
- Invasive Bacterial Infections
- Vector- and Animal-Borne Diseases
- Respiratory Pathogens of Special Interest
- Other Notifiable Disease Categories (e.g., *Legionella*, tuberculosis, anthrax)
- Other Surveillance Categories

This staged approach allows the project team to prioritize development, test questionnaire logic and data flow in a controlled environment, and scale effectively across more complex or lower-incidence disease groups.

The system is being developed with a flexible, metadata-based design—essentially a condition-driven structure that enables dynamic question selection based on diagnosis, case characteristics, and surveillance needs. Because questionnaires vary by disease, the metadata framework allows the system to tailor which questions appear and when, without requiring new form development for each condition. This ensures clinical relevance while supporting efficient integration with other systems and the Directorate of Health's central databases.

3. Service Flow for Notifiable Disease Case Handling

The following section outlines the process that occurs when a case of a notifiable disease is identified—either clinically or through laboratory confirmation—and how that case is registered and managed within the national surveillance system.

The proposed service flow is structured in four key steps:

- **Initiation of the Notifiable Disease Process**
  (Patient encounter, sample collection, or clinical assessment)
- **Submission of Notification and Case Creation**
  (Laboratory or physician-generated notifications result in a unified case ID)
- **Physician Follow-Up and Questionnaire Processing**
  (Data collection through standardized physician-completed electronic questionnaires)
- **Final Submission and Central Integration by the Directorate of Health**
  (Finalized case data stored and classified in centralized databases)

Each step is outlined in greater detail below.

Initiation of the Notifiable Disease Process

The process typically begins when a patient presents to a physician. Based on clinical evaluation:

- The physician may collect a biological sample and send it to the laboratory for testing;
- In some cases, where clinical criteria are clear, a sample may not be required, and the disease is assessed and reported based on symptoms.

Submission of Notifications and Case Creation

For laboratory-confirmed diseases, the notification process is typically triggered through regular batch transfers from the national laboratory information management system. Positive test results that meet reporting criteria are included in these submissions, and each generates a unique case ID within the surveillance system. This ID serves as the central reference point to which all subsequent data, clinical input, electronic questionnaires, and contact-tracing activities are linked.

Physician Follow-Up and Questionnaire Processing

Following laboratory-confirmed notifications, which account for most reported cases, further data collection may be triggered as part of the surveillance process.

- The physician may reassess the patient, initiate or adjust treatment, and collect additional clinical or epidemiological data.

- If applicable, the physician initiates contact tracing to identify and manage close contacts.

At this stage, structured questionnaires are deployed to collect standardized and disease-specific information. These include:

- A core questionnaire, which contains questions applicable to all notifiable diseases.
- Disease-specific modules, tailored to the clinical and epidemiological characteristics of the disease being reported.

Questionnaires are completed exclusively by physicians or other health workers within the e-health system or through a secure redirect to the new surveillance platform. The data collected are automatically linked to the case record and support surveillance, case validation, and public health follow-up.

To facilitate this process, a proposed improvement involves triggering an automatic reminder or notification when a relevant questionnaire is associated with a case—either via the physician's workspace in the e-health system or through the new surveillance platform. This ensures timely completion and linkage of all relevant case information.

Since questionnaires vary by disease and condition, the system is being designed to support flexible and sustainable questionnaire management, ensuring ease of use for clinicians and alignment with surveillance goals.

Final Submission and Central Integration by the Directorate of Health

Supplementary information on notifiable diseases is submitted to the Directorate of Health, where it is linked to the original case and stored in centralized data repositories for analysis, reporting, and epidemiological monitoring.

4. System Integration

Within the system architecture:

- All data points—including laboratory confirmations, clinical input, biological sample metadata, and contact-tracing information—are linked to a single case ID within the Directorate of Health's centralized database.
- The laboratory and contact-tracing subsystems are integrated, ensuring that test results and tracing activities are connected to the same case record.
- Standardized electronic questionnaires, comprising both core and disease-specific modules, may be deployed at various stages to support structured and consistent data collection.

This flexible workflow reflects the complexity of real-world case management and ensures that both clinically assessed and laboratory-confirmed cases are captured, linked, and processed within a unified surveillance framework.

The project team is actively reviewing procurement-related aspects, including the timeline and scope for issuing a call for tenders. Evaluations are underway to determine the most appropriate technical framework and tools for system development, including whether the platform will be implemented within the existing Directorate of Health infrastructure used for technical documentation and data management.

5. Strategic Outlook Toward Full System Deployment

The system rollout and development activities outlined in this plan are scheduled to culminate in the full operationalization of the ISNSS IT platform (*Deliverable D5.3*) by Month 44 (August 2028).

Progress will be monitored and assessed through *Deliverable D5.2*, the Preparation Progress Report on IT Development, due in Month 19 (July 2026). This report will document the implementation status of deployed components, summarize pilot outcomes, highlight technical adjustments, and evaluate user feedback to guide final refinements ahead of full deployment.

Deployment Phases

Phase	**Start**	**End**	**Description**
Phase 1: Design & Planning	Jan 2025	June 2025	Workflow alignment, stakeholder consultations, disease categorization, metadata design, and technical scoping.
Phase 2: System Development & Configuration	July 2025	Sept 2025	Build questionnaire framework for disease groups 1–4, design and test mockups, define branching logic, and finalize technical specifications.
Phase 3: Testing & Initial Deployment	Oct 2025	Apr 2026	Prototype, user experience; test flexible interfaces; Programming of system. Evaluate e-health reminders and integration with other systems; iterate with clinical users. Finish questionnaire framework for remaining disease groups.

Phase 4: Contact Tracing Platform & Monitoring	Nov 2025	Mar 2027	Develop a platform for managing cases and contacts; enable automated messaging, mass invitations, and longitudinal monitoring.
Phase 5: Registry Integration	Sept 2025	Dec 2027	Plan and test integration of central registries; E.g. Death Register, Vaccination Register, and Hospital Discharge Register (samskiptaskrá) into the surveillance system.
Phase 6: Full IT Systems Deployment	Jan 2028	Aug 2028	Final rollout to all disease groups; system stabilization, stakeholder training, and readiness for **D5.3** submission (Month 44).

***** *The following table outlines the planned deployment phases of WP5 activities. Specific dates may be refined as development and procurement activities progress.*

Activities

Timeline	**Key Activities**	**Task**	**Outputs / Milestones**	**Participants**
April 2025	Kick-off meeting and initial stakeholder alignment	T5.1	Key decisions on system scope, triggers, and abstraction process	DOHI
Fall 2025	Procurement path confirmed and call for tenders initiated	T5.2	Call for tenders initiated	DOHI, outside IT consultants
September 2025	Disease service flow, stage 1	T5.3	Finalize pilot questionnaire modules for disease groups 1–4. Mockup and data model	DOHI, IT solutions provider, outside IT consultants
October 2025	Service deployment schedule	T5.1	Submit D5.1 deliverable — Includes workflows, metadata structure, and questionnaire logic	DOHI
November 2025	Official rollout of stage 1	T5.4	Disease groups 1–4 rollout; tests system scaling and metadata branching logic	DOHI, IT solutions provider, outside IT consultants

January 2026	Legal and organizational framework finalized	T5.7	Roles assigned, governance structure defined, data protection procedures ensured	DOHI
March 2026	Design work for contact tracing	T5.3	Mockups and data model	DOHI, IT solutions provider,
May 2026	Rollout of final disease groups	T5.4	System scaling, metadata reuse, EHR integration testing	DOHI, IT solutions provider, outside IT consultants
July 2026 (M19)	Progress Report on IT Development	T5.1	Submit D5.2 — Mid-project evaluation of implementation progress	DOHI
Mid 2026-March 2027	Contact tracing and messaging systems prototyped	T5.5	Completing functional components beyond questionnaire deployment	IT solutions provider, outside IT consultants
Spring–Fall 2027	Register integrations planned and piloted	T5.6	Integration of Death, Vaccination, and Hospital Discharge Registers	DOHI
January-August 2028	Systematic monitoring & final adjustments	T5.6	Longitudinal monitoring features added, workflows refined	DOHI
By August 2028	System stabilization and go-live for national use (→ D5.3)	T5.1	Final commissioning of the fully operational WP5 system	DOHI

***** *The following indicative timeline outlines the planned phases of WP5 activities. Specific implementation dates may be refined as procurement and piloting progress.*

The current timeline reflects the expected rollout pace based on available technical capacity and stakeholder engagement. **Adjustments to specific implementation dates may occur prior to Deliverable D5.1**, as procurement and piloting processes evolve.

6. Risk and Considerations

Implementation of the ISNSS IT development plan depends on coordinated progress across technical, clinical, and administrative partners. At this stage, the principal risks identified for

WP5 concern potential technical delays, integration challenges, and the coordination required between multiple data environments.

To mitigate these risks, the Directorate of Health has established proactive management procedures that ensure early identification of issues and structured follow-up. Regular monitoring of milestones at the task level allows for timely adjustments and support when technical challenges arise.

The Directorate of Health maintains strong internal technical capacity and complements this expertise through collaboration with external IT consultants when specialized knowledge is required. Infrastructure planning and procurement preparation are being initiated early to minimize bottlenecks and maintain project momentum.

In addition, the project team is preparing to pilot selected system components within a secure internal environment to verify interoperability, data protection, and performance before external deployment. This phased approach supports scalability, continuity, and resilience.

Risks related to system security, data protection, and service continuity are managed in line with established Directorate procedures, including service and performance monitoring and compliance with the European General Data Protection Regulation (GDPR).

The overall likelihood of major disruption is considered low to medium, and the Directorate of Health is confident that existing governance structures, expertise, and coordination mechanisms will ensure the timely delivery of WP5 milestones.

7. Conclusion

Deliverable D5.1 presents the initial service deployment and improvement plan for ISNSS IT development. The Directorate of Health and project partners have defined the system architecture, workflow framework, and staged rollout plan. Upcoming deliverables will document progressive implementation, testing, and registry integration activities leading to full operational deployment by Month 44 (August 2028).