Digital Transformation of Immunisation

National Digital Health Information Costed Country Roadmap Toolkit

Guidance and templates for national immunisation programme prioritisation and planning

November 2022

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As part of Gavi, The Vaccine Alliance's efforts to monitor the use of our digital health information resources and to gather recommendations to improve them in future versions, we have set up a dedicated e-mail DHI@Gavi.org. Please let us know what you have found useful and what we can do better in the next iteration. Thank you!

Introduction

Over the past three years, Gavi, the Vaccine Alliance has engaged in a strategic review process to identify digital health information interventions and enablers that will have the most significant impact on immunisation outcomes to achieve the Gavi 5.0 goals and objectives with a specific focus on zero-dose and under-immunised children. The strengthening of digital health information interventions for immunisation is viewed as an entry point to improving primary health care and contributing to universal health coverage.
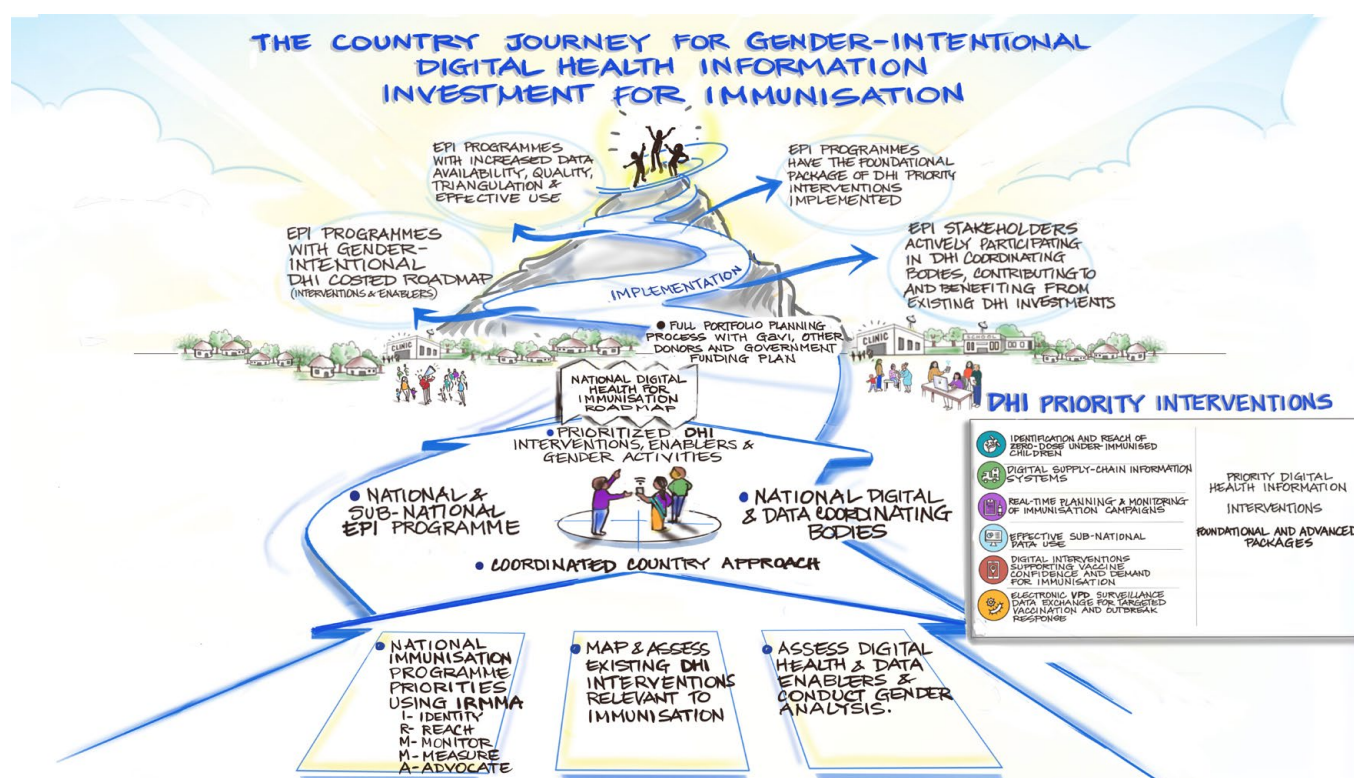
Gavi's resulting Digital Health Information Strategy and accompanying resources are intended to coordinate global and national immunisation efforts to invest in integrated, equitable, gender-intentional information systems that will improve the delivery of life-saving vaccines for all children. The Gavi Digital Health Information Strategy identifies six promising digital application areas to accelerate immunisation outcomes and overcome common immunisation programme challenges. These priorities are the result of 3 years of stakeholder consultation, documentation, and evidence reviews with peer-review and refinement at each stage to identify the most promising and effective digital health information interventions.

The guiding principles are

1. Countries have many immunisation challenges to address with limited funds, and often prioritize key challenges as part of program strategy. This toolkit aims to help countries better identify digital health information interventions that can specifically address their prioritized immunisation challenges.

2. Countries require significant investments in digital health enablers and no one health vertical can or should support all enablers. The toolkit facilitates the prioritisation of digital health enablers that can be supported through a coordinated effort across public and private sectors as well as through the funding agencies.

3. The Gender Digital Divide threatens to undermine investments in digital health information. Gender-intentional digital health interventions and enablers are facilitated through complementary gender-related activities identified through gender analysis planning, and monitoring.

This toolkit leverages these principles to help countries to better benefit from their existing new

Figure 1: The country journey for gender-intentional digital health information ivestment for immunisation

digital health information investments and ensure that these investments address the priority health needs. It will guide national Ministries of Health Directors and Managers of the Essential Programme for Immunisation (EPI) and Digital Health, immunisation programmes and digital health governing bodies to **prioritise and plan digital health information** interventions, enablers, and gender-related activities for strengthening the immunisation programme and improving the delivery of life-saving vaccines for all children. This toolkit was developed by HealthEnabled in close collaboration with UNICEF and Gavi leveraging experience from an iterative process to apply the Gavi DHI Strategy to the development of National Digital Health Information for Immunisation Costed Roadmaps in Cambodia, Central African Republic (CAR), Ethiopia, and Nigeria. This toolkit will guide other countries in their effort to develop similar costed roadmaps aligned to the Gavi strategy, while addressing their country immunisation and health priorities.

Each of the country *Costed Roadmaps* are plans that align to each country's national immunisation, digital health strategy, primary health care, and universal health coverage priorities to help guide gender-intentional digital health information for immunisation investment and activities for the future. They draw on the Country Journey for Gender-Intentional Digital Health Information Investment for Immunisation.
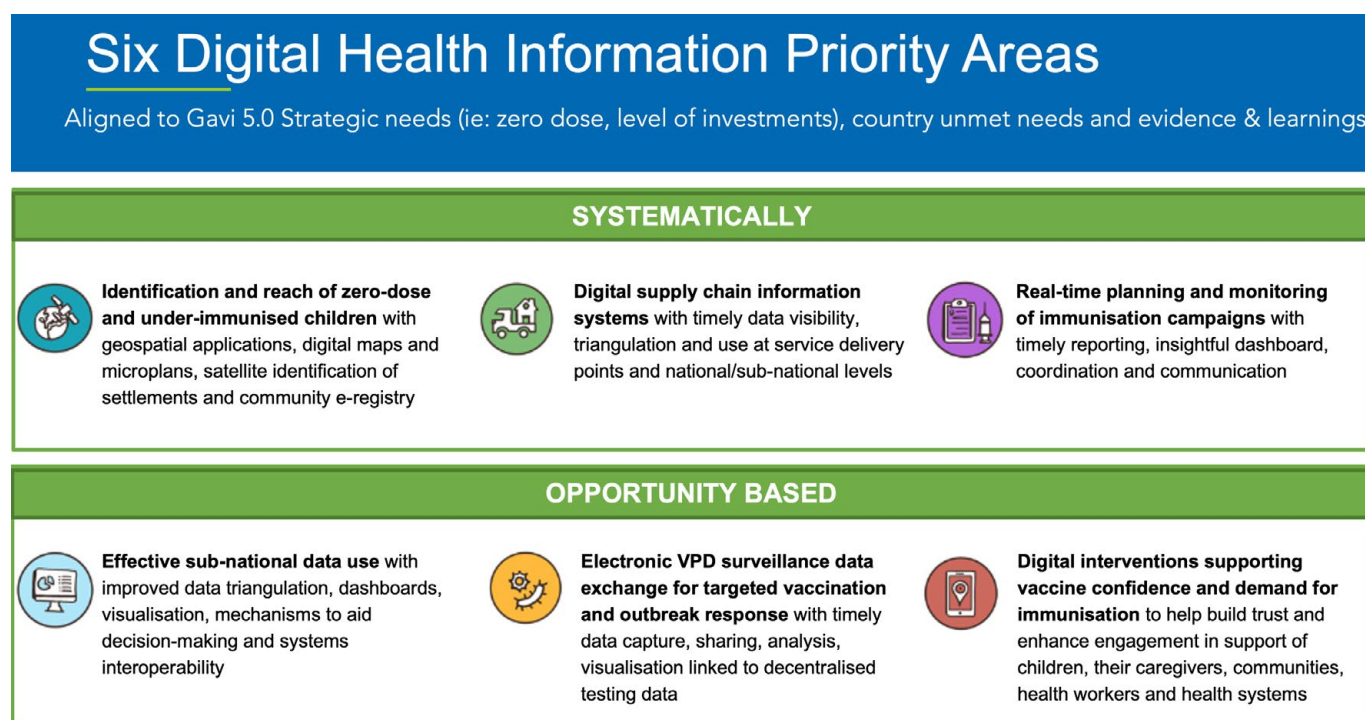
The resulting National Digital Health Information for Immunisation Costed Roadmap can be used by country programmes to guide coordinated national investment and requests to donors to increase overall immunisation programme effectiveness, sustainability, and digital health maturity and create requests for Gavi funding and to inform each country's Gavi's Full Portfolio Planning Process.

This Toolkit provides step-by-step guidance, worksheets, workshop agendas, and materials to lead a country journey for digital health investment for immunisation. This begins with a desk review,

Figure 2: Digital Health Information for Immunisation Costed Roadmap Process

Steps	Methods	Resources
STEP 1: Understand the current environment and existing implementation of digital health information for immunisation		
A: Understand national immunisation priorities	Desk review	Stakeholder mapping Desk review checklist Sample interview guide GDHI score card Analysis of existing DHI for immunisation Analysis of gender-related barriers Analysis of enabling environment to support DHI
B: Understand national digital health ecosystem	Key informants and small focus groups	
C: Understand enablers and gender system	Brainstorm and small group work	
STEP 2: Through sub-national and national workshops, identify digital health interventions, enablers and gender-related activities aligned to immunisation piorities at sub-national level & develop a draft national-level roadmap		
D: Identify priority digital health interventions enablers and gender-related activities	Engage national and sub-national stakeholders	Sample workshop agenda Roadmap timeline activity
E: Develop draft national roadmap	Small work group sessions	
STEP 3: Review and finalise national roadmap and engage relevant stakeholder in budgeting		Costing template Costing decision flow illustration Sample cost estimate & timeline template dditional resources
F: Budget and finalise roadmap	Working group session	

Figure 3: Six digital health information priority areas

Six Digital Health Information Priority Areas

Aligned to Gavi 5.0 Strategic needs (ie: zero dose, level of investments), country unmet needs and evidence & learnings

SYSTEMATICALLY

Identification and reach of zero-dose and under-immunised children with geospatial applications, digital maps and microplans, satellite identification of settlements and community e-registry

Digital supply chain information systems with timely data visibility, triangulation and use at service delivery points and national/sub-national levels

Real-time planning and monitoring of immunisation campaigns with timely reporting, insightful dashboard, coordination and communication

OPPORTUNITY BASED

Effective sub-national data use with improved data triangulation, dashboards, visualisation, mechanisms to aid decision-making and systems interoperability

Electronic VPD surveillance data exchange for targeted vaccination and outbreak response with timely data capture, sharing, analysis, visualisation linked to decentralised testing data

Digital interventions supporting vaccine confidence and demand for immunisation to help build trust and enhance engagement in support of children, their caregivers, communities, health workers and health systems

key informant interviews and a series of participatory prioritisation and planning workshops to identify the key needs, opportunities, and barriers in the immunisation programme. The rapid prioritisation and roadmap development process is meant to be an active process that will leverage existing efforts, identify priority investments, and lay the foundation to better allocate resources in a targeted manner for maximum impact. The process outlined here will help stakeholders identify which digital health information interventions and enablers will improve service delivery and overall immunisation coverage and equity to create a plan that is aligned to country outcomes to help guide investment and activities for the future.

Costed Roadmap Development Process: Steps & Resources

The following steps and resources can be used by countries to support a systematic country DHI roadmap development process. It begins with Step 1 – Through desk review and country stakeholder interviews, gain an understanding of the national immunisation and digital health strategies, policies, and priorities and then maps the current state of digital health information interventions for immunisation, enablers, and gender digital divide and relevant gender dynamics. It continues with Step 2 – Workshops to facilitate national (or sub-national) prioritization of current DHI investments and development of country investment plans, followed by Step 3 - costing the prioritised digital health intervention enablers, and gender-related activities.

Gavi DHI Strategy Foundational Inputs

The Gavi DHI Strategy offers six vetted digital health information intervention priority areas that map to the common challenges faced by national immunisation programmes. These help countries to better prioritise relevant digital health interventions and move beyond the common practice of one-solution for everything. It Also helps the country look to using digital investment for addressing health system challenges, and not just for public health data collection. A rapid assessment of the current digital health interventions addressing immunization can be conducted and grouped by their potential to impact the six DHI priority areas.

Through the use of the Global Digital Health Index and Maturity Model, a country's digital health enabling environment maturity model can be determined. The enabler-areas needed most attention can easily be identified from generated score-card. If the country does not already have a score-card on the GDHI, or the scorecard is out-of-date, a new score card can be generated and through a rapid assessment of their digital health maturity and then align to those digital health enablers prioritised in the Gavi DHI Strategy as having the greatest impact on immunisation.

Gavi's Digital Health Information Strategy includes a strong focus on **gender-intentional planning and programming**, taking steps to ensure that investments support equitable representation, participation, and meaningful engagement of women, gender-diverse people, and men in the analysis,

> ### Box 1: Digital Health Information Enablers Prioritised for Immunisation
>
> • Country landscapes and maturity assessments to understand the context and prioritise digital health interventions and enablers
> • Standards for interoperability, data governance, integrated data management and cross cutting information technology systems
> • Dedicated and sustained resources to support scale up, institutionalisation and long-term maintenance of digital health applications
> • Infrastructure - Information Technology equipment, maintenance, internet connectivity and data management and storage systems
> • Diversity of solutions designed with sub-national users and healthy markets
> • Private sector engagement
> • Community & Civil Society Organisation engagement
> • Governance structure for decision-making, national coordinating body and MOH strategic vision for DHI including the national health information system
> • Scalable capacity building opportunities

planning, and monitoring of digital health interventions and in leadership, governance, and the health workforce. In some settings, women face challenges accessing immunisation services and information as well as the digital tools and technologies that are intended to improve health systems, knowledge and communication among the health workforce and caregivers. Gender dynamics, the cultural ideas about gender roles that influence relationships and interactions between people, can impact the coverage, access, and uptake of health services. To increase access and use of prioritised digital health tools and technologies for immunisation, Gavi recognises the importance of gender-intentional programming, an aspect that is highlighted throughout this Toolkit and in the accompanying resource, *Gender-Intentional Digital Health Intervention & Enabler Prioritisation: A Rapid Guide for Analysis, Planning, and Monitoring*.

The Country Journey for Digital Health Information Investment for Immunisation culminates in the achievement of four country-focused outcomes, namely:

• EPI Programmes with Gender-intentional DHI Costed Roadmap (interventions & enablers)

• EPI Programmes with increased data availability, quality, triangulation, and effective use

• EPI Programmes have the foundational package of DHI priority interventions implemented

• EPI Stakeholders actively participating in DHI coordinating bodies, contributing and benefiting from existing DHI investments

The overall process is an adaptation of the WHO Digital Implementation Investment Guide tailored for rapid use by National Immunisation Programme Directors and Managers in collaboration with National Digital Health Programme Directors and Managers. It can take as little as 6 weeks to complete, but on average with various rounds of review takes approximately three months to complete. This process is feasible with minimal resource commitment.

Step 1: Background Assessment

The first step in planning for the implementation of digital health information for immunisation is to understand the national strategies, policies, priorities, and existing interventions for both immunisation and digital health as well as the state of the gender digital divide. In addition, it is important to identify and engage all relevant stakeholders from the beginning of and throughout the roadmap development process.

The Background Assessment should align to existing national strategies and priorities for both immunisation and digital health. Any current immunization (or EPI) situational analysis, strategy, assessment or plans should form the basis and starting point for the Roadmap process. Many Gavi-supported countries may have conducted an assessment of immunisation priorities using the IRMMA framework (Identify – Reach – Monitor – Measure - Advocate) to develop their EPI / immunisation programme Strategy or Plans which focuses on zero-dose and under-immunised children and serves as an excellent starting point for more in-depth assessment of digital health information within the immunisation programme.

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Prioritised DHI interventions have mapped to the IRMMA with those more related to data such as

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Box 2: Aims/objectives of the Background Assessment

Through review of relevant strategies, policies, literature, and stakeholder engagement

a. Understand the National Immunisation priorities

b. Understand the current state of digital health interventions

c. Understand the current state of digital health enablers, and gender

The Background Assessment provides the basis and starting point to prioritise and plan for investments in digital health information for immunisation.

Figure 4: Using the Identify, Reach, Measure and Monitor and Advocate (IRMMA) Framework to Inform DHI Prioritisation

Who, Where, Why, How many zero dose children

Use evidence to make a case for political attention and resources

Tailored and sustainable strategies addressing supply and demand-side barriers and to serve as a platform for broader integrated PHC over the life course

Monitor real time Measure outcomes Learn to improve

Advocate — Identify — Listen and understand — Reach — Tailor strategies — Zero-dose and missed communities — Find and describe — Integrate and sustain — Measure & monitor

geospatial, sub-national, and disease surveillance aligned to Identifying zero-dose and under-immunised children and advocacy and additional DHI interventions more aligned to addressing supply and demand side barriers.

Desk Review

An important starting point for the roadmap development process is a desk review. A desk review is the kind of background research that someone can do at their desk with a computer, some documents, an internet connection, and a focus on a particular topic. In this case the desk review's aim is **to uncover current information, statistics and existing programmes using digital health information for immunisation, vaccine delivery, or broader primary health care (PHC) in a particular country**. A thoughtful desk review will save time and help build on previous assessments, data, and experiences.

Individuals conducting the desk review should review and document all activities related to immunisation and digital health technologies in the country by all partners, national and international implementers, and any relevant regional initiatives. This information, together with interviews, focus groups and small group work with key stakeholders, will create the background and help generate an understanding of the experiences and current state of digital health interventions used for immunisation programming. This information will help focus, guide, and inform interviews and conversations. It provides a high-level overview of the country context to guide stakeholder

engagement and prepare for the prioritisation exercises.

The desk review will help key stakeholders to understand the current state of existing digital health information for immunisation in the country, the current state of the enabling environment for digital health and existing gender-based challenges and gender dynamics that impact the successful application of DHI interventions for immunisation.

The desk review includes as an important component making a list of all relevant digital health and immunisation stakeholders, partners, and implementers in the country. During the desk review this list will continue to grow as more projects, interventions, stakeholders, and organisations are identified.

To conduct a systematic search of both published literature, project reports, national guidance and existing strategic plans, the Desk Review Checklist provides suggestions of key documents and search strategies as well as specific databases likely to contain information on digital health and immunisation.

The desk review is not meant to be overly time-consuming. It takes approximately three to five days to complete the background research in consultation with international agencies and non-governmental organisations, departments, and team leads in the EPI programme and national Digital Health coordinating body or technology for health government agencies. Be sure to factor an additional three to five days to write a summary report or briefing document.

Resource 1: Desk Review Checklist

Begin the desk review with any available National programme strategies or reports. Dedicate time to research each of the four Resource categories listed in the matrix.

Resource	What to look for
National Immunisation Strategy **OR**	What are the **prioritised digital health information activities** and/or the potential for DHI interventions to address immunisation priorities?
National Immunisation Situational Analysis Most recent date of publication: _____	What is the **geographic scale and scope of functions** in existing digital health information activities that address immunisation priorities? How do these interventions align with the six Gavi priority areas?
Period/years covered in the strategy: _____	What are the **gender-related priorities** for immunisation leadership, supervision, workforce and caregiver engagement?
National Digital Health Strategy	What are the **prioritised interventions** that apply to immunisation and/or prioritised enablers?
Most recent date of publication: _____	What are the **gender-related priorities** for digital health leadership, workforce and caregiver engagement?
Period/years covered in the strategy: _____	What are the priority digital health enablers? Are there existing investments in these enablers?
Published research literature	Search Pubmed and/or Google Scholar databases for articles from the past 10 years with keywords and **Country_Name** (immunisation OR immunization OR vaccine OR polio OR measles OR covid OR EPI) AND (electronic OR mHealth OR eHealth OR technology OR digital) AND "**Country_Name**"
Implementing partner, stakeholder, national and global databases	National and regional partner, CSO, NGO websites (see STAKEHOLDER LIST) Digital Health Atlas database COVID-19 Map & Match

Stakeholder Mapping

Begin by making a list of stakeholders involved in digital health and immunisation in the country with consultation and validation with the immunisation / EPI team. Continue to add to this list during the desk review. This list will help identify key informants for interviews, focus groups, and potential workshop participants for Step 2.

Resource 2: Stakeholder Mapping Table

Organisation / partner/ stakeholder / government agency	Geographic area and programmatic focus	Key contact person and contact information

Key Informant Interviews

Much of the most up-to-date experiences and knowledge about digital health technologies for immunisation in the country may not be easily found in reports, publications, or documents. It is important to speak to people who have direct experience in relevant programmes, interventions, and planning decisions.

Interviews may be conducted with individual stakeholders or **key informants** or as **focus group discussions** with a small group of four or five similar stakeholders who are guided to share ideas and discuss the topic together.

It is useful to have a standard set of questions to guide interviews with multiple stakeholders, while also being flexible and asking follow-up questions in areas where the key informant or focus group may have more experience or ideas. The sample questions below should be adapted to fit the country's context structured to help fill any gaps or missing information from the desk review.

Resource 3: Sample Interview Guide

What digital health interventions have been used as part of the national immunisation programme? Which ones have been implemented at scale? Which have the potential to scale?
What digital health interventions and solutions are used in other health sectors that may be suitable to build-on, transfer or expand functionality for immunisation?
Within each of the six prioritised digital health intervention areas for immunisation, what has been implemented in the country? At what scale?
Identification and reach of zero-dose and under-immunised children. Ask about geo-enabled health information systems (using GIS and satellite data), master lists, facility registries and the use of digital tools for immunisation microplanning.
Digital Supply Chain Information Systems. Ask about National logistics management information systems (LMIS) or plans in digital health strategy. Ask about the use of technology and applications for forecasting.
Real-time planning and monitoring of campaigns. Identify planned campaigns and how digital health tools have been used during supplementary immunisation activities (SIA) in the past.
Effective use of sub-national data. Ask about the use of data integration and dashboards and how they are used for immunisation planning, service delivery, and monitoring at different levels.
Vaccine-preventable diseases surveillance. Ask questions about any existing national systems for reporting Covid-19 and vaccine preventable diseases.
Demand generation and vaccine confidence. Ask questions about any national hotlines for the national immunisation programme. Ask questions about how AEFI are reported and addressed.
Cross-cutting digital health enablers
What are the plans for digital health capacity building, staffing, and digitally-talented health workforce development?
Gender, digital health and immunisation
What are the national gender priorities related to health?
What are the national gender priorities related to immunisation?
What are the national gender priorities related to information and communication technology/ gender digital divide/ digital health and/or data use?
What are the main institutions responsible for gender programming in the country?
What are the top 2 gender priorities related to digital health and immunisation?

Analyses through Small Group Work

In addition to individual interviews with implementing partners and stakeholders, it will also be useful to bring together small working groups either as part of a workshop agenda or as a pre-workshop brainstorming session. The following approaches can strengthen and support the background assessment:

•   Analysis of existing DHI interventions for immunisation

•   Analysis of state of DHI enablers using the Global Digital Health Index (GDHI)

•   Analysis of gender-related barriers

Analysis of Existing DHI Interventions for Immunisation

Small groups of stakeholders representing different sub-national regions can provide valuable insight into the current use of DHI interventions being implemented and the challenges and opportunities in their respective geographic areas. Small working groups and teams involved in this activity should consult any existing country immunisation situational analysis to provide more information on existing or planned digital health investments for immunisation.

Depending on the format, time, and resources available for this prioritisation exercise, it may be possible to include this consultation as part of the first day of a 2-day workshop or as part of individual regional sub-national consultation meetings, focus groups, or mini-workshops.

The DHI Priority Interventions Worksheet has been created and used to facilitate small group brainstorming and prioritisation of key activities, enablers, and gender considerations. There should be one worksheet / group for each of the 6 DHI for immunisation priority areas. This ensures that national roadmaps consider a broad range of digital health interventions that are more targeted to their specific context and priorities.

Resource 4: DHI Priority Interventions Worksheet

Gavi DHI Priority Area: Identification and Reach of Zero-Dose and Under-Immunised Children with geospatial applications, smart maps, digital micro-plans, satellite identification of settlements and community e-registry		
Current State: What do digital health interventions look like in this area now?	**Enablers:** What are some of the foundational systems and infrastructure necessary to support this area?	**Priority Interventions:** What interventions or projects are needed to achieve the goal state? What milestones or stages will lead to success?
Goal State: What do digital health interventions look like in this area ideally?	**Gender:** How does gender inequality or gender dynamics impact the success of interventions of this area?	

Analysis of DHI Enablers Using Global Digital Health Index

The Global Digital Health Index captures and tracks country digital health enabler data with standard criteria that can be used to gauge the maturity and development of indicators related to the foundations and enabling environment for digital health and immunisation. The seven GDHI indicators in the box below can be a useful starting point to understand a country's foundational systems and institutions that can jump start a conversation about priorities and realistic targets. If the country has recent GDHI data, these can be used to inform the enabler portion of the Background Assessment. If the country has not completed the assessment or the information is out-of-

date, request a country-specific link to the survey tool by sending an email to info@digitalhealthindex.org. The survey takes approximately one to two hours to complete by a small group of individuals familiar with the digital health landscape in the country.

When completing a new GHDI scorecard survey, it is recommended to engage as many stakeholders from the Digital Health team at the Ministry of Health as possible. This will help to bring together EPI and Digital Health more strategically by supporting Digital Health stakeholders to understand immunisation priorities and needs and for immunisation programme to invest in enablers that align with Digital Health priorities.

Box 3: Seven key indicator categories from the Global Digital Health Index (aligned to the WHO/ ITU eHealth Strategy Toolkit)

Leadership and governance

Strategy and investment

Services and applications

Standards and interoperability

Infrastructure

Legislation, policy and compliance

Workforce

Resource 5: GDHI Enablers Matrix

Indicator Categories	Phase/Score
Leadership and Governance	
Strategy & Investment	
Legislation, Policy, and Compliance	
Infrastructure	
Workforce	
Standards and Interoperability	
Services & Applications	
Average Score	

Resource 6: DHI Gender-Intentional Considerations and Activities Worksheet

Gavi DHI Priority Area: Identification and Reach of Zero-Dose and Under-Immunised Children with geospatial applications, smart maps, digital micro-plans, satellite identification of settlements and community e-registry

Gender Digital Divide: To what extent do men, women, girls, and gender minority groups have equal access to, use and development of digital tools and technologies? Consider end users in the home, community, workplace, and from different demographic, socio-economic, minority groups and geographic areas.	**Gender dynamics:** How do relationships and interactions between men, women and gender minorities influence the power and authority to access and use digital tools and technologies? Consider relationships in the home, in the community and in the workplace as well as different demographic, socio-economic, minority groups and geographic areas.	**Priority Actions:** What gender-intentional actions will improve the intended outcomes of the proposed DH intervention and promote equity, inclusion, diversity and accessibility for all users and relevant stakeholders?
Engagement and use: How will existing inequalities in the access and use of digital technologies and data (in the home or the workplace) impact the intended use/engagement with the proposed intervention by key stakeholders and end-users?	**Stakeholder representation:** Consider how all stakeholders will be included in the design, development, and activities with meaningful engagement, listening, hearing, and sharing diverse viewpoints. How will these key stakeholder groups be included? Clients, caregivers, and communities Health workers and providers Technology professionals, content developers, and implementers Policy-makers and decision-makers	

Analysis of gender-related barriers

It is important to initiate discussions and brainstorming about the gender digital divide and gender-related barriers to digital health information and technologies during the prioritisation process. More detailed guidance on gender-intentional programming can be found in the accompanying guide, *Gender-Intentional Digital Health Intervention & Enabler Prioritisation: A Rapid Guide for Analysis, Planning, and Monitoring*. A sample worksheet below may be adapted for use with small groups to stimulate discussion and start conversations about how gender-intentional programme design can increase access to digital health services, information, and interventions.

OUTCOME of the Background Assessment

The result of the desk review, key informant interviews, and small group discussions is a 10-page document,

internal report, slide presentation and/or briefing document that includes:

- Overview of the country context, background, challenges, recent experiences, and opportunities for digital transformation of immunisation

- Mapping of immunisation, digital health and data stakeholders and implementing agencies in the country

- Identification of scaled or potentially scalable digital health interventions for immunisation

- Understanding of digital health enablers and critical gender considerations

This information and summary of the Background Assessment will help inform and guide the prioritisation exercises in Step 2.

Step 2: Through Sub-national and National Workshops Develop Draft National-level Roadmap

There are many potential activities under the six Gavi DHI areas, that it is essential to select the ones that are most relevant and show the most promise to address sub-national immunisation challenges and align with national immunisation goals. The second step in the process is to prioritise the top priority activities and enablers that will be the focus for sustainable investment and growth in the coming 5 years. This is best accomplished through engagement with sub-national level immunisation stakeholders who can share the immunisation priorities for which and the digital health interventions, enablers, and gender-related activities that are most likely to help address them.

Box 4: Aims/objectives of the National Roadmap Drafting Process

d. Engage sub-national immunisation stakeholders to identify priority digital health interventions enablers and gender-related activities

d. Engage national immunisation and digital health stakeholders to develop a draft national roadmap

The Prioritisation and Vision exercises will build on the Background Assessment and incorporate stakeholder views, experiences, challenges, and needs to create a draft plan for the next 5-years.

Prioritisation & Planning Workshop(s)

A workshop provides stakeholders involved with DHI for immunisation in the country an opportunity to gather for an intensive and active agenda. The workshop should encourage discussion, promote sharing of ideas and experiences, and strive to find agreement on the most important and relevant DHI applications for the future. This can be accomplished by adding digital health prioritisation to existing EPI strategy and planning meetings or by convening dedicated workshop(s) for the purpose of prioritisation and planning. Depending on time and resources

available, one or multiple workshops may be organised at the national and/or sub-national levels. Typically workshops last 1 or 2 days depending on the needs of the assessment team, number of stakeholders, and context.

The workshop will create a common understanding and consensus from key stakeholders and decision-makers on the most important areas to focus investment and interventions in the coming 5 years. Depending on the context and situation, the workshop may also present an opportunity for brainstorming about the current state to complete the Background Assessment (see Brainstorming and Small Group Work). The workshop may be especially useful for gathering sub-national perspectives and views on current use of digital technologies, challenges, and experiences.

The following are prioritised stakeholders for engagement in workshops:

•   Immunisation / Expanded Programme for Immunisation (EPI) National and sub-National leadership and decision-makers

•   Related Ministry of Health / government agencies responsible for Digital Health

•   UNICEF and WHO regional and country-level teams

•   Relevant implementing partners (e.g. USAID, CHAI, JSI, PATH etc)

The following materials are recommended to help facilitate and guide key stakeholder engagement:

•   Presentation slides

•   Projector equipment

•   Flip chart poster paper

•   Markers

•   Sticky notes

•   Optional: Mentimeter or other interactive live polling application

The following are the expected outcomes of the workshops:

- Increased understanding of the digital context in which the immunisation programme operates with a list of existing DHI for immunisation interventions based on knowledge and experience

- Increased appreciation for the six DHI prioritised intervention areas and how they map to common immunisation priorities and challenges, especially reaching zero-dose and under-immunised children

- Existing DHI interventions for immunisation according to the six Gavi DHI priority areas and relevant national digital health guidance, strategies, standards, and policies categorised

- New activities for future development and investment in DHI for immunisation to fill in relevant gaps identified

- Top three priority digital health enablers/ foundations for future investment identified

- Key gender-related barriers, gender dynamics and gender considerations related to DHI for immunisation discussed and activities to address them identified

- Increased understanding of the role of national and subnational stakeholders and implementing partners related to DHI for immunisation in the country

A sample workshop agenda, worksheets, and activities are included in the section below to be adapted depending on the focus, time available and needs of the country prioritisation process, workshop goals and stakeholder composition.

Resource 7: Sample Workshop Agenda

Time	Activity
8:30 - 9:00	**Tea and coffee**
9:00 - 9:15	**Welcome Remarks**
9:15 - 10:00	**Introductions and Workshop Overview** • Mentimeter Poll / discussion question: How do you use your mobile phone and/or computer to support your health and wellbeing? • Mentimeter Poll / discussion question: What are the main immunisation challenges that you face in your *[state, province, district]*? Or in the country more broadly? • Mentimeter Poll / discussion question: What immunisation challenges do you think digital tools can support?
10:00 – 10:30	**Presentation:** Digital Health Information for Immunisation Opportunities – Areas, Enablers, and Gender [Summary of Desk Review & Key Informant Interviews]
10:30 – 11:00	**Tea Break**
11:00 – 12:00	*[State, Province, District]* **Working Session** (Prioritisation Template) • What are the *[State, province, district]* immunisation priorities? • What digital health information interventions are already being implemented? • What new interventions should be introduced?
12:00 - 13:00	**Plenary discussion session:** *[State, Province, District]* Immunisation Digital Health Priority Interventions • Identify shared priorities (across settings) and those specific to each context
13:00 - 13:45	**Lunch**
13:45 – 14:00	**Presentation:** Summary of Global Digital Health Index Enablers
14:00 – 14:30	**State Working Session** (Enablers Template) • What enablers should be prioritised? • What gender-related considerations for immunisation and digital health information do you feel need to be prioritised?
14:30-15:00	**Plenary discussion session:** *[State, Province, District]* Digital Health Enablers & Gender considerations • Identify shared priorities (across settings) and those specific to each context
15:00 - 15:30	**Plenary Post-It Session & Discussion:** Recommendations for National-level Activities to support DHI for Immunisation at Sub-national Level • What 2-3 activities should the National Immunisation Programme prioritise to support Sub-national DHI Immunisation activities?
15:30-16:00	Wrap up & Next Steps

Resource 8: DHI Activity Prioritisation Worksheet

The DHI Activity Prioritisation Worksheet has been designed and used for small group brainstorming of prioritised activities. There should be one worksheet for each of the 6 priority DHI for immunisation areas. This activity may be included as part of a workshop or possibly in a different meeting/small working group after the Prioritisation workshop.

Gavi DHI Priority Area: Identification and Reach of Zero-Dose and Under-Immunised Children with geospatial applications, smart maps, digital micro-plans, satellite identification of settlements and community e-registry

Goal State: What does this area look like ideally? *(input from previous small group work under Step 1)*

Priority Interventions: *(input from previous small group work under Step 1)*

Activities: What activities are needed to achieve the goal state?	**Budget considerations:** What are the min costs associated with this activity?	**Non-Financial Support needed:** What type of support other than funding is needed for these activities? This may include things like technical assistance, design support, analyses, training, etc.
Activities to support Enablers		
Activities to support Gender-intentional programming		

Resource 9: Roadmap Activities & Timeline Template

An important step in the roadmap development process is to list out activities and map them onto a timeline. The following template facilitates the translation of prioritised activities by DHI for immunisation priority area and provides a seventh section within which to list out specific activities related to enablers and gender. This can be circulated for review and refinement and then used as the basis for costing.

DHI Priorities	Activities	Year 1	Year 2	Year 3	Year 4	Year 5
1. Zero dose identification & reach						
2. Subnational data use						
3. Real time monitoring of campaigns						
4. Supply chain information systems SCIS - eLMIS						
5. Vaccine confidence and demand generation						
6. VPD Surveillance						
7. Cross cutting enablers and gender activities						

Monitoring & Evaluation Priorities and Learning Questions

As the saying goes, "that which is measured gets done," it is important to identify targets for the prioritised interventions. These targets can be related to scale and coverage of a DHI intervention or enabler for example deploy real-time monitoring in all or a percentage of districts and/or human resources as in provide digital literacy training for all or percentage of health workers. They can also be related to immunisation programme performance as in the case of percent of zero-dose and under-immunised children reached through effective use of geo-enabled micro plans. At the time of roadmap development,

it is important to set targets and identify relevant monitoring, evaluation, and learning (MEL) activities through a MEL Plan.

One can start by answering the following questions:

- What activities will support the monitoring of DHI investments for immunisation?

- What 2-3 learning questions will help translate experiences into future sale-up and expansion?

- What opportunities are there for large-scale effectiveness studies to contribute to the evidence base?

Resource 10: DHI for Immunisation Costed Roadmap MEL Plan

DHI Priorities	Activities	Targets	Methods for monitoring, measuring, and/or evaluating targets
1. Zero dose identification & reach			
2. Subnational data use			
3. Real time monitoring of campaigns			
4. Supply chain information systems SCIS - eLMIS			
5. Vaccine confidence and demand generation			
6. VPD Surveillance			
7. Cross cutting enablers and gender activities			

OUTCOME of the Draft Roadmap Development Process

After all information gathered during the workshop is captured and synthesised, it is important to have a follow-up meeting with the core team to process, consolidate and refine the information and views recorded from the exercises and sessions.

A summary workshop report should be prepared with details of the participants, discussions, and outputs of the prioritisation exercises.

A summary list of prioritised activities, enablers, and gender considerations as well as the targets and learning questions identified in the MEL Plan will form the basis of the budgeting and planning process in Step 3.

Step 3: Planning and Costing for Digital Health Information (DHI) priorities

Successful DHI implementation depends on proper planning and budgeting to make sure that activities and improvements are appropriate and will be sustained over time. A 5-year budget plan for each of the prioritised activities identified in Step 2 can help develop funding requests and Gavi Full Portfolio Planning as well as coordinate funding streams from multiple donors and national investment priorities.

Box 5: Aims/objectives Planning and Budget Process

f.   Develop a gender intentional budgeted plan for each of the identified priority intervention, and enablers

The planning process and budget will depend on the current level of scale of the identified priority interventions and activities, the size and maturity of the country immunisation programme, the existing digital health enabling environment and other variables. The background assessment and prioritisation exercises should form the foundation of the planning and budget process.

Planning and budgeting must include the estimated costs of equipment and devices, but most of the DHI for immunisation investment plans will also include human resource capacity development, training, workshops, monitoring and evaluation for any implementation or enabling environment strengthening. To plan effective and sustainable interventions, activities, or applications, it is recommended that costs are estimated across all phases and supporting activities in the project cycle, not just the cost of new equipment or a budget for pilot project implementation. The cost drivers will vary depending on the nature of the digital health investment, for instance, a health facility aggregate style electronic system for integrated surveillance will require less design and support than an equivalent case-based system.

The table below can help focus attention on all phases and categories of implementation to ensure a realistic and comprehensive budget plan and timeline.

In the Gavi's DHI Strategy, foundational DHI interventions are those interventions that countries can consider when developing their roadmap. These interventions are low hanging fruits that countries can leverage to get quick wins regarding many areas of the six DHI for immunisation priority areas. Similarly, Advanced package of interventions, as defined by the Gavi's DHI Strategy requires further maturity in the digital health enabling environment to succeed. Gavi high impact countries (Democratic Republic of Congo, Ethiopia, India, Nigeria, Pakistan) may consider these after determining that they have the desired level of digital health enabler maturity based on the Global Digital Health Index (GDHI) score-card maturity.

Table 1: Digital Health Information Foundational and Advanced Packages

DHI Priority Area	All countries Foundational package	High Impact: ADDITIONAL Advanced package
Cross Cutting	• National Immunisation Strategies, Programmes, and Policies with a targeted focus on zero-dose and under-immunised children (including IRMMA) are used to prioritise DHI interventions for scale building on relevant existing digital health interventions within PHC • National DHI ecosystem and cross-cutting ICT systems assessment and gender analysis to are used to prioritise DHI enablers and gender-related activities • Active engagement between EPI and digital health and data coordinating bodies is promoted to produce a National Gender-intentional DHI for Immunisation Roadmap (interventions & enablers)	
Identification and reach of zero-dose and under-immunised children	•Subnational triangulation dashboard with high-resolution/ fidelity population estimates Linkages with authoritative master lists that need to display immunisation services •Intelligent sub-national map displaying immunisation services, catchment area boundaries and estimated population (from different sources)	•Systematic use of geospatial data and technologies at scale •Digital microplanning at district/facility level is fully geo-enabled and at scale to support RI and campaigns •Satellite identification of missed settlements
Digital supply chain information systems (eLMIS)	•Aligned and coordinated Digital Supply Chain Information governance body •Assessment of digital & eLMIS maturity •Investment roadmap for eLMIS scale-up •Health facility stock visibility	•Comprehensive digital supply chain information system segmented package based on maturity assessment (A/ established system, B/deployment, C/integration & interoperability, D/ geographical extension, E/sustainability, F/track and trace)
Real-time planning and monitoring of immunisation campaigns	•Real-time monitoring for the planning and assessment of campaign readiness • Real-time monitoring dashboard with coverage, stock, and AEFI data	•Digital microplanning for the campaigns
Effective sub-national data use	•Integrated dashboard (coverage/VPD/Stock data) •Dashboard for microplanning and monitoring •Data use including operational data at sub-national levels	•Functional, interoperable, integrated, and regularly updated immunisation information system •Systematic use of immunisation data
Digital interventions supporting vaccine confidence and demand for immunisation	•Digital aggregate AEFI surveillance •Introduce or scale-up one intervention for community-based vaccine confidence and demand, this includes better engagement with community leaders and community health workers to identify and report births, register children for immunisation, and send out SMS reminders for routine immunisation	•System for monitoring vaccine confidence, community sentiment and barriers to access •Electronic system to facilitate two-way dialog with community •Implement electronic system for birth notification
Electronic VPD surveillance data exchange for targeted vaccination and outbreak response	•E-aggregate VPD surveillance information system •linkages between decentralised diagnostic information system, VPD Surveillance and EPI	•E-case-based VPD surveillance system •Geospatial data incorporated into disease surveillance, investigation, and case-notification systems

Funding Guidance from Gavi DHI Strategy

Based on early country testing of the Gav DHI Strategy, countries are willing and able to programme >10% of HSS grant budgets on average to improve impact, scale, and sustainability of digital health interventions. Considering how the DHI priorities support all the Health System pillar, it is recommended that they allocate a minimum of 10% of the HSS budget, and this will be a catalytic investment to build on other donor investments. Costing for DHI is context-specific- largely driven by the scope and scale of the population size and number and location of children to be immunised, geographic distribution of the population, and number of districts, facilities and health workers within each country. For the six DHI intervention areas greater investment is needed for geospatial data generation and use for zero-dose identification and more accurate denominators, eLMIS for better vaccine distribution and supply chain optimisation, and increasing demand and vaccine confidence and lower cost investments with greater value for money in sub-national data use, real-time monitoring of campaigns, and electronic disease surveillance. In countries with larger Gavi HSS grant budgets, DHI may represent a small percentage of the overall budget. For countries with smaller budgets, DHI will represent a large proportion of the budget as capital investment cost is important per country.

Resource 11: Overview of Cost Drivers for DHI Activities

[Table adapted from Principles for Digital Development Guidance]

Category	Cost drivers	Key considerations
Management and staffing	Salary, training, and travel expenses	What is the baseline level of staff capacity? Will implementation require new hires and/or training to build capacity?
Development and Setup	Requirements gathering, Design of the interventions/applications, UAT, Equipment, hardware, and software (licensing, customisation, installation, interoperability, and data sharing)	What is the estimated cost of requirement gathering, design & testing, hardware & software? Do the current staff have the capacity to customise, configure, troubleshoot, and maintain the required software and hardware? How will the proposed software/hardware operate with existing tools and systems?
Deployment	Training, implementation (small scale), document experiences, make refinements and improvements based on implementation experiences, data connectivity and power, continuous review and updating for interoperability with national data infrastructure and governance	Who should be trained and at which health system levels? Be sure to budget for implementation challenges, refinements, and improvements. How will devices be powered, charged, and share data and what are the associated costs? How many users need to be trained on the new systems?
Scale	Expand the reach of the intervention or associated application based on the small-scale deployment (pilot project) experiences	Learn from the first deployment to scale the solution. Consider future end users and invest in long-term assets, including human resources
Operations	Data transfer, ongoing maintenance, support, administration, replacement/renewal, refresher training, monitoring & evaluation, and learning.	How much data and storage will be needed per user? How frequently will you need to replace hardware, renew software licences, and provide refresher training? How will monitoring and evaluation be conducted?

Costing DHI Interventions, Enablers, Gender Activities, and MEL Plan

The following costing template can help guide the budgeting process. Use one worksheet for each of the prioritised activities related to interventions, enablers, gender-related activities, and MEL.

The generalised planning, budgeting and timeline considerations outlined here can be used to prepare a multi-year project plan, budget, and funding request for the sustainable integration of identified priority activities to strengthen DHI in the immunisation programme. The key considerations will depend on prioritised DHI activities and interventions for immunisation. Some public goods templates have been developed for some prioritised DHI interventions and can guide how planning is approached. See the costing decision flow illustration to choose appropriate templates and additional guidance resources listed below.
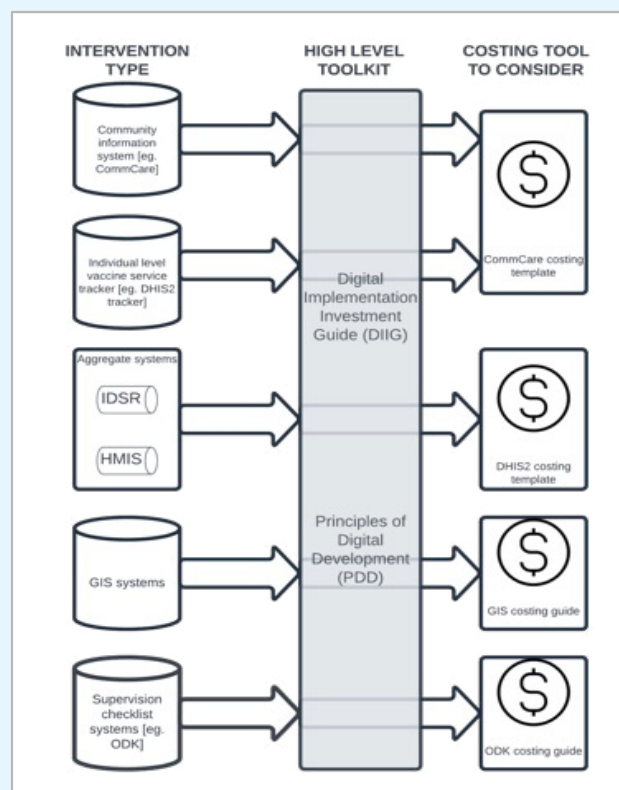
Resource 12: DHI Investment Roadmap Costing Template

[Table adapted from WHO DIIG]

	Year	Year 2	Year 3	Year 4	Year 5	5-year total
Management and Staffing						
Development and set up						
Deployment						
Scale						
Operations						
Total						

Box 6: Additional Resources for Planning and Budgeting

The planning process and budget will depend on the current level of scale of the identified priority interventions and activities, the size and maturity of the country immunisation programme, the existing digital health enabling environment and other variables. The background assessment and prioritisation exercises should form the foundation of the planning and budget process.

- CommCare Total Cost of Ownership (TCO) tool

- Leveraging Geospatial Technologies and Data to Strengthen Immunisation Programmes: Rapid guidance for investment planning

    - Direct link to PDF - English

    - Direct link to PDF - French

- How to Calculate Total Lifetime Costs of Enterprise Software Solutions

- WHO's Digital Implementation Investment Guide (DIIG) chapter 7 pg.99-108

- ODK costing guide

FINAL OUTCOME: Costed Digital Health Information (DHI) for Immunisation Roadmap

As a final outcome from the entire process, the Gender-intentional Costed DHI Roadmap document should be prepared and validated to guide the country's investments and funding requests to development partners for the coming 5 years. It should serve as a reference and checkpoint for decision-makers, donors, and implementers. Multiple drafting sessions may be required with the core prioritisation team to create a complete draft of the document that should be shared, discussed, and validated with all key stakeholders. The final gender-intentional costed roadmap document should include:

- Summary of the background assessment, desk review, key informant interview and pre-workshop consultations

- Overview of prioritisation exercises, process, and stakeholder involvement

- Prioritised activities, including support and development for the enabling environment and gender considerations

- Activity timeline, targets, and costs

Resource 13: Activities, Targets, Cost Estimates & Timeline Template

DHI Priorities	Activities	Target	Year 1	Year 2	Year 3	Year 4	Year 5	Total Budget
1. Zero dose identification & reach			$	$	$	$	$	$$
2. Subnational data use								
3. Real time monitoring of campaigns								
4. Supply chain information systems SCIS - eLMIS								
5. Vaccine confidence and demand generation								
6. VPD Surveillance								
7. Cross cutting enablers and gender activities								

Conclusion

The digital transformation of immunisation is an important entry point for primary health care in low and middle-income countries. The Gavi Digital Health Information Strategy provides a high-level vision, outcomes, and prioritisation of interventions, enablers, and gender-related activities that serve as a foundation for countries to develop National Digital Health Information for Immunisation Costed Roadmaps. Through pilot testing of the strategy and roadmap development process in Cambodia, Central African Republic, Ethiopia, and Nigeria this resource was developed to guide other countries to undertake similar processes. The final roadmaps for these countries will be made available upon request to show how this process was applied in several contexts and the outputs it generated.

The completion of the DHI for immunisation assessment and prioritisation process will generate a tailored plan for relevant digital health information interventions, enablers, and gender-related activities that are appropriate to the individual country context. This plan can help countries articulate their long-term systems strengthening goals to increase overall immunisation programme effectiveness in line with national priorities, strategies, and policies.

The final Gender-intentional Costed DHI for Immunisation Roadmap can help inform the country's full portfolio planning (FPP) process to apply for Gavi funding every 5 years. The Roadmap can direct and focus overall investments and feed into specific funding requests and other grant opportunities to support immunisation. The DHI Roadmap for immunisation can serve as a useful tool for advocacy and to lead the strengthening of the DHI enabling environment in support of wider universal health care systems goals, while ensuring that no child is left behind with immunisation.