National eHealth Strategy Toolkit

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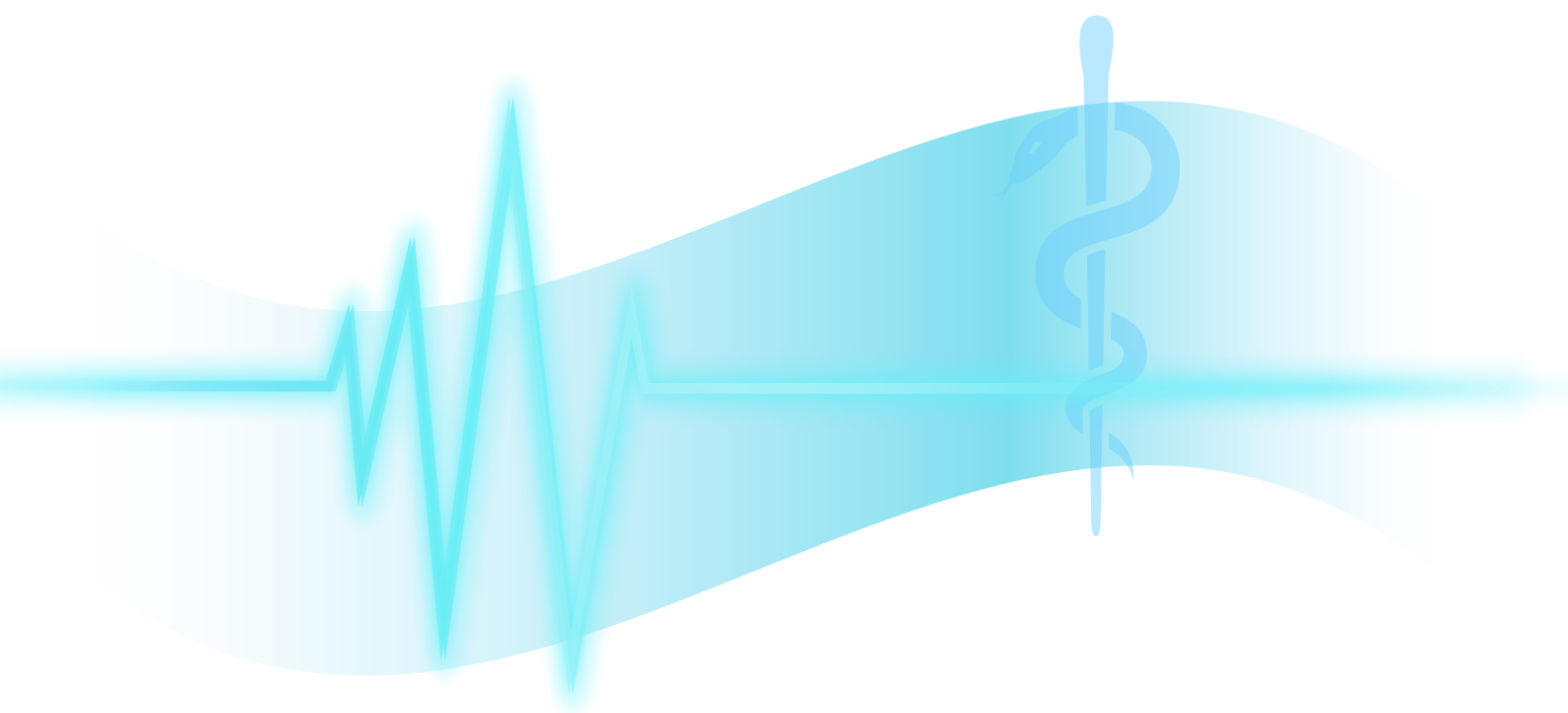
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Foreword

The World Health Organization (WHO) and the International Telecommunication Union (ITU) are pleased to present this *National eHealth Strategy Toolkit*. WHO and ITU have a long history of working together, and this new publication represents one of our most substantial and significant collaborations of recent years. It fully reflects the importance that the governing bodies of our two organizations attach to the development of national eHealth strategies.

This is a shared work that reflects a shared goal – responding to the needs of countries, at every level of development, who seek to adapt and employ the latest information communication technologies (ICT) in health for the measurable benefit of their citizens. The *National eHealth Strategy Toolkit* is a milestone in our understanding of what eHealth is, what it can do, and why and how it should be applied to health care today.

The Toolkit is a comprehensive, practical guide that all governments, their ministries, departments and agencies can adapt to suit their own circumstances and their own vision and goals. Its publication is very timely. This is a period when all health systems face stringent economic challenges, greater demands for efficiencies and higher expectations from citizens. There is, everywhere, an urgent challenge to provide more care and better care to more people, especially those most in need.

This Toolkit expertly demonstrates how all nations can rise to that challenge, each in its own way. While it brings the sectors of health and ICT much closer together, the Toolkit also encourages the active participation of a wider range of stakeholders, including the general public, reflecting important issues of social justice and equity. By bringing all of these interested parties together, the Toolkit offers them a chance to share in a unique national project whose ambition is nothing less than to achieve lasting progress in public and individual health.

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Acknowledgements

Contents

Introduction to the National eHealth Strategy Toolkit

The Toolkit: What it is and who it is for

This *National eHealth Strategy Toolkit* reflects the growing impact that eHealth is bringing to the delivery of health care around the world today, and how it is making health systems more efficient and more responsive to people's needs and expectations.

The Toolkit provides a framework and method for the development of a national eHealth vision, action plan and monitoring framework. It is a resource that can be applied by all governments that are developing or revitalizing a national eHealth strategy, whatever their current level of eHealth advancement.

It is a practical, comprehensive, step-by-step guide, directed chiefly towards the most relevant government departments and agencies, particularly ministries of health and ministries of information technology and communication.

Although the Toolkit is comprehensive, it does not need to be comprehensively employed. Individual governments and their departments can tailor it to their own national policies, resources and requirements, and to the expectations of their citizens. They can choose, refine and develop the parts that are best for them and create their own unique eHealth vision.

The successful application of the Toolkit does, however, require a team experienced in strategic planning, analysis and communication process. One of the team's early priorities should be deciding at what point to bring stakeholders into the process. This is important in managing the process itself, because the team will have to work closely and continuously with the many stakeholders, not just those from the health sector, who have an interest in eHealth and are keen to contribute. Deferring their involvement until the core team is well established and has begun its work, rather than engaging the stakeholders from the very start may prove more efficient in the long run.

Like all strategies and plans, the outcomes of this Toolkit are not static and represent a point-in-time understanding of what a country needs to achieve in order to address its particular goals and challenges. Changes in a country's strategic context will require a dynamic approach to updating the eHealth vision and the associated action plan so that they remain relevant. This requires understanding the key triggers for refreshing the vision and action plan, whether these are specific events that change a nation's strategic context for eHealth or a defined period of time after which a revision is required.

Ongoing engagement with essential health and non-health stakeholders must also be maintained. Success in implementing a national eHealth vision is heavily dependent on having the continued support and guidance of stakeholders, and thus does not reach a conclusion after a national strategy has been developed.

Continued communication is also vital. Stakeholders should be regularly informed on the progress of the programme, and in particular, any impacts or results that implementation of the progress has realised. This ensures transparency, which is essential to maintaining stakeholder support and momentum for further activity and investment in eHealth.

The Toolkit is designed in three parts, with the second and third parts building progressively on the work of the first:

- ▶ Part 1: A national eHealth vision that responds to health and development goals

- ▶ Part 2: A national eHealth action plan that reflects country priorities

- ▶ Part 3: A plan to monitor implementation and manage associated risks.

Part 1 develops a national eHealth vision that responds to health and development goals. It explains why a national approach to eHealth is needed, what a national eHealth plan will need to achieve, and how it will be done.

- ▶ *Why:* This is the strategic context for eHealth, encompassing the health of the population, the status of the health system, the health and development priorities, and the resulting implications for eHealth.

- ▶ *What:* This is the role eHealth will play in the achievement of health-sector goals. It serves as a high-level message for policy-makers that answers the question of "where does our country want to go with health, and how will eHealth help us get there?"

- ▶ *How:* This gives the various eHealth components – or building blocks – that must be in place to realize the national eHealth vision.

Part 2 lays out an eHealth action plan that reflects country priorities and the eHealth context. It structures activities over the medium term, while building a foundation for the long term.

Part 3 establishes a plan to monitor implementation and manage associated risks. It shows the progress and the results of implementation and helps in securing long-term support and investment.

Each of these three sections describes the activities required, along with practical advice informed by real-world experience. Countries can undertake the entire set of activities, or those specific to their contexts and constraints. How the Toolkit is used, and the end result, will depend on these factors and on each country's priorities and vision.

Countries can focus on a range of structured activities that lead to the progressive development of a national eHealth strategy. These include:

- ▶ involving the key health and non-health stakeholders in creating a national eHealth vision and plan and its subsequent implementation.

- ▶ establishing governance mechanisms to provide improved visibility, coordination and control of eHealth activities that are occurring across the country's health sector.

- ▶ establishing the strategic context for eHealth to provide the foundation for the eHealth vision and plan, and to enable the government to make informed decisions on whether to pursue opportunities that present themselves from the ICT industry and other stakeholders.

- ▶ forming an understanding of the current eHealth environment in terms of the programmes, projects and eHealth components that already exist.

- ▶ the Toolkit also identifies the short-, medium- and long-term goals for countries, recognizing the importance of demonstrating outcomes and benefits throughout the process of national strategy implementation, and to build and maintain momentum and support for eHealth; and thereby improve the health of their populations.

Finally, while it is aimed at a specialized, professional readership, the Toolkit's approach keeps the general public firmly in mind, recognizing that it is the public who will be the ultimate beneficiaries of eHealth in their country.

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Worldwide, the application of information and communication technologies to support national health-care services is rapidly expanding and increasingly important. This is especially so at a time when all health systems face stringent economic challenges and greater demands to provide more and better care, especially to those most in need.

The *National eHealth Strategy Toolkit* is an expert, practical guide that provides governments, their ministries and stakeholders with a solid foundation and method for the development and implementation of a national eHealth vision, action plan and monitoring framework. All countries, whatever their level of development, can adapt the Toolkit to suit their own circumstances.

Representing one of the most significant collaborations in recent years between the World Health Organization and the International Telecommunication Union, the Toolkit is a landmark in understanding what eHealth is, what it can do, and why and how it should be applied to health care today.

Cover art: base map made with Natural Earth; illustration by Marilyn Langfeld

National eHealth Strategy Toolkit

Establishing a National eHealth Vision

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National eHealth Strategy Toolkit

PART 1

Establishing a National eHealth Vision

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PART 1
Establishing a national eHealth vision

Purpose

The *National eHealth Strategy Toolkit* is an essential resource for developing or revitalizing a country's eHealth strategy. It can be used equally by countries just setting out and those which have already invested significantly in eHealth. This latter group includes countries now seeking to build on promising results from pilot initiatives, to establish foundations for scaling-up eHealth projects, or to update current strategies to reflect changing economic circumstances. Whatever the starting point, experience shows that eHealth efforts can be strengthened, accelerated or aligned through a national strategic planning process.

Audience

The Toolkit is intended for use by government health sector leaders in ministries, departments and agencies who will manage the development of an eHealth strategy. The successful application of the Toolkit requires a team experienced in strategic planning, analysis and communication.

Part 1	Part 2	Part 3
National eHealth vision (This document)	**National eHealth action plan**	**National eHealth monitoring and evaluation**
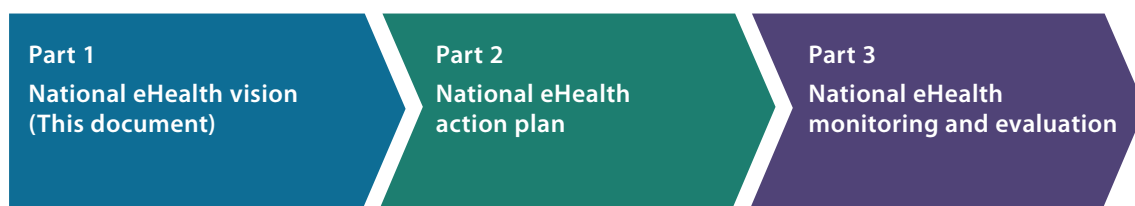
Orientation to Part 1

The first part of the Toolkit consists of 12 chapters and focuses on developing the national eHealth vision.

▶ Chapters 1–3 give an overview of eHealth, the elements of a national eHealth vision, and the method of developing it.

▶ Chapters 4–5 describe how to manage the vision process and work with stakeholders.

▶ Chapters 6–12 provide a detailed guide to gathering and analyzing information, constructing and refining the eHealth visions and recommendations. Appendices give additional information and tools to support this Toolkit, including definitions of some frequently used terms.

Contents

Part 1. Establishing a national eHealth vision

Chapters

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CHAPTER 1
National context for eHealth

1.1   The case for eHealth[1]

eHealth is changing health-care delivery today and is at the core of responsive health systems. The daily business of health relies on information and communication and, increasingly, on the technologies that enable it, at every level and in every country. This is equally so in delivering care, deploying personnel, managing programmes or conducting research.

The World Health Organization defines eHealth as the use of information and communication technologies (ICT) for health[2]. In its broadest sense, eHealth is concerned with improving the flow of information, through electronic means, to support the delivery of health services and the management of health systems. ICT provides significant benefits not only in achieving health goals, but also in demonstrating what has been attained and at what cost.

The case for adopting these technologies has been evident for over a decade. However, it has taken a crisis in the health sector in many countries to move eHealth from the periphery to the centre of strategic health planning.

In an increasingly digital world, spurred by technological advances, economic investment, and social and cultural changes, there is growing recognition that inevitably the health sector must integrate ICT into its way of doing business. This applies whether the goal is to reach all citizens with high-quality, equitable and safe care, or to meet obligations for public health research, reporting and humanitarian action.

1.2   The need for a national approach

Today, all countries must strive to ensure that funds for health are spent wisely. The workforces in many health systems are shrinking in parallel with a growing demand for better services and more accountability for results. Population shifts, rapid urbanization and poverty are also putting greater demands on health systems.

Consequently, governments are recognizing that incorporating ICT is a priority for health systems development. Experience shows that this requires strategic and integrated action at the national level, to make the best use of existing capacity while providing a solid foundation for investment and innovation. Establishing the main directions as well as planning the detailed steps that are needed is crucial to achieving longer-term goals such as universal access to care, health sector efficiency, reform or more fundamental transformation.

Collaboration between the health and ICT sectors, both public and private, is central to this effort. The major United Nations agencies for health and telecommunications respectively, the World Health Organization (WHO) and the International Telecommunication Union (ITU) have

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1   Adapted from Dzenowagis J. Preface. In: Dean K, Rajarajan M, eds. *The health and care revolution*. Ghent, EAI Publishing, 2011.

2   *Building foundations for eHealth: progress of Member States: report of the WHO Global Observatory for eHealth*. Geneva, World Health Organization, 2006 (www.who.int/goe/publications, accessed 14 May 2012).

recognized the importance of collaboration for eHealth in their governing body resolutions[3], which encourage countries to develop national eHealth strategies. This Toolkit supports those recommendations.

Ministries of health play a pivotal role, not only in meeting people's needs for care and protecting public health, but in preserving health systems through uncertain times. Ministries of information technology and telecommunications are essential to development in all spheres, and can make a vital contribution to the health sector. Common goals and a predictable ICT environment enable coordinated action: building consensus on policy, facilitating better use of shared resources and involvement of the private sector, and investment in ICT skills and infrastructure to improve health outcomes.

While eHealth strategies deliver direct national benefits, they can also improve regional cooperation. This is demonstrated by European Union countries, which are experiencing a political momentum to advance eHealth for the benefit of their citizens and health systems. These countries are being encouraged to establish new mechanisms to foster 'smart growth' and innovation to overcome current economic challenges.

1.3 eHealth in health systems and services

Advances in ICT have yielded substantial dividends to both individual health and public health. From the local to the national level, ICT is changing how health care is delivered and how health systems are run. It supports critical functions by improving the ability to gather, analyse, manage and exchange information in all areas of health, from research on molecular genetics to large-scale humanitarian interventions and disaster relief (Table 1).

In health systems, information and communication technologies are being used to improve the timeliness and accuracy of public health reporting and to facilitate disease monitoring and surveillance. They are fundamental in distance learning, and in enabling rapid response in emergencies. Furthermore, the strategic use of eHealth can support sector-wide planning as well as coordinating decentralized district health systems, and improving the ability to plan, budget and deliver services.

eHealth has been described as a means to ensure that "the right health information is provided to the right person at the right place and time in a secure, electronic form to optimise the quality and efficiency of health care delivery, research, education and knowledge[4]. Towards that end, information exchange such as through electronic health records, patient registries and shared knowledge resources is critical. Information systems and tools for diagnosis, prevention and treatment support health care at all levels. They also enable the efficient and accountable delivery of essential supplies, such as drugs, vaccines and equipment through the management of procurement, supply and distribution chains.

Health information that is of high quality, reliable, affordable and accessible – and the capacity to understand and use it – is a hallmark of empowerment. And empowerment – informing choice for citizens and health professionals alike – is another driver for eHealth.

Examples of eHealth and eHealth applications are in Annexes A and B, respectively.

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3   World Health Assembly Resolution 58.28 (2005): www.who.int; World Telecommunication Development Conference Resolution 65 (2010): www.itu.int.

4   See definition of eHealth in: *National E-Health and Information Principal Committee. National E-Health Strategy, 30th September 2008.* Adelaide, Deloitte Touche Tohmatsu, 2008.

Table 1. Examples of the impact of eHealth[5]

Stakeholders	Impact of eHealth
Citizens	• Enables personalized care, throughout the health system and across the lifespan • Makes health care available at home, at work or in school – not just the hospital or clinic • Focuses on prevention, education and self-management • Facilitates reaching out to peers for advice and support
Professionals in research and practice	• Gives access to current, specialized, accredited knowledge for clinical care, research and public health; and to research, publications and databases • Enables communication between patients and providers • Makes high-quality distance learning for basic and continuing professional education readily available • Allows remote consultations with patients, for second opinions, and with professional networks
Hospitals, academia and public health	• Establishes hospitals as a virtual network of providers, connecting all levels of the system • Monitors quality and safety; improves care processes and reduces the possibility of medical errors • Assists mobility of citizens and their medical records – providing patient information when and where needed • Opens new opportunities in basic and applied research; from health knowledge to policy and action • Extends collaboration and shared computing power (e.g. grid and cloud computing) • Delivers services despite distance and time barriers • Standardizes ordering and delivery of drugs and supplies
Health-related businesses	• Provides health content as a commodity to the public and health professionals. • Facilitates research and development of new products and services: electronic health records, information systems, and clinical registries. • Enables broad and cost-effective marketing for health products and services to businesses and governments, locally and abroad.
Governments	• Delivers more reliable, responsive and timely reporting on public health; as health becomes increasingly central to economy, security, foreign affairs and international relationships. • Creates enabling environments rather than technology limitations. • Offers new roles for stakeholders, health professionals, authorities, citizens and others. • Identifies disease and risk factor trends; analyses demographic, social and health data; models diseases in populations

1.4   The context for eHealth development

This Toolkit starts from the premise that a country's eHealth strategy should be based on national health priorities, the available and potential resources, and the current eHealth environment. A national vision for eHealth also takes shape within a national context that can be considered in terms of two dimensions. The ICT environment (vertical axis) represents the national ICT market and overall penetration of computing and networking infrastructure. The enabling environment for eHealth (horizontal axis) is fundamental to scaling up and sustaining ICT adoption in the health sector. It includes aspects such as governance, policy, legislation, standards and human resources (Figure 1).

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5   Dzenowagis J. *Connecting for health: global vision, local insight.* Geneva, World Health Organization, 2005.

Figure 1. National context for eHealth development
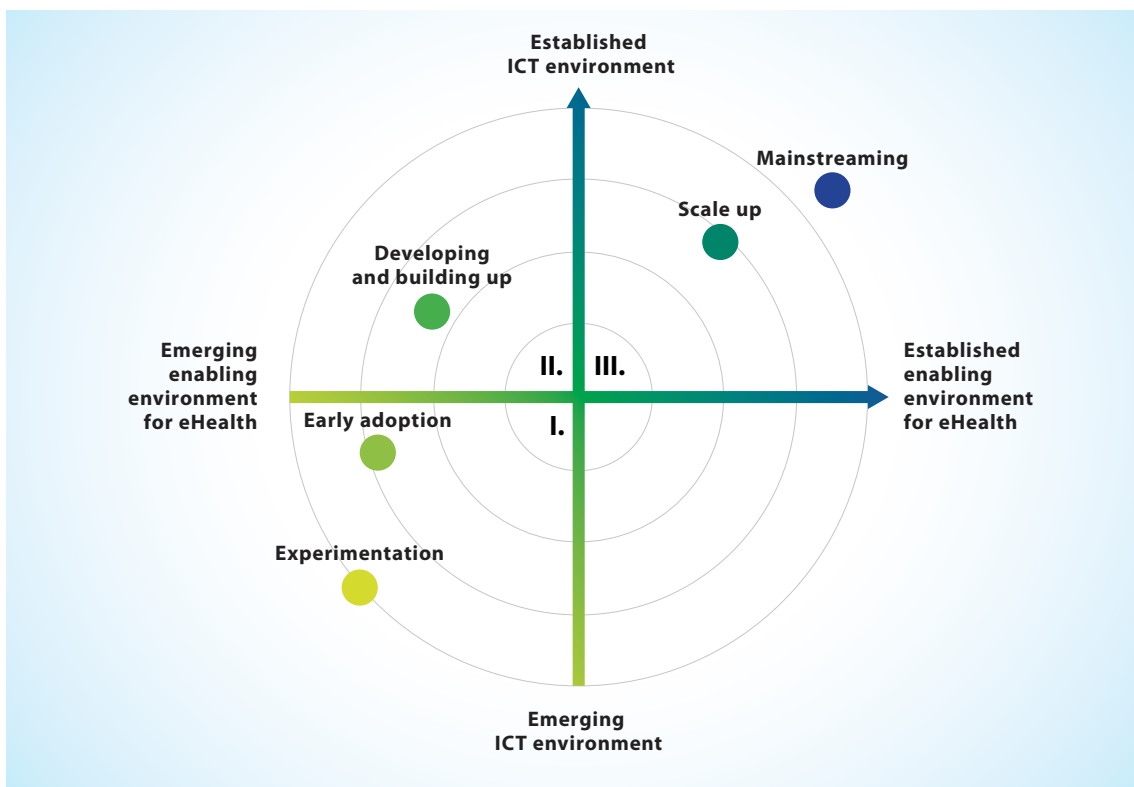
Based on the ICT environment and enabling environment for eHealth, the national context can be described in the following way:

▶ *Experimentation and early adoption*, where both the ICT and enabling environments are at an early stage

▶ *Developing and building up*, where the ICT environment grows at a faster rate than the enabling environment

▶ *Scaling up and mainstreaming*, during which the enabling environment matures to support the broader adoption of ICT.

These contexts are explained in the next three sections with a summary at the end (Table 2).

I. Experimentation and early adoption

Consider as an example a country where the ICT environment and enabling environment for eHealth are both in their early stages. Within this national context, eHealth is project-based, featuring a few small initiatives that are seldom connected to each other. Projects tend to be time-limited, proof-of-concept pilots, where ICT is introduced (or imported) to demonstrate a technology in a limited context. The ICT applications used may themselves be innovative, but the projects are rarely sustainable.

They fail because of a lack of infrastructure and skills, a narrow focus on one particular aspect of eHealth that disregards other concerns and impacts, and a lack of ownership by the health entities involved. The use of ICT in the general population in this country is limited to not much more than mobile phones. The commercial ICT market is fragmented, with little local expertise available. The government has no role in funding and technical support for eHealth. This comes instead from aid agencies, donors, nongovernmental organizations (NGOs) and consultants. In this constrained environment, the country cannot consistently meet its international obligations for public health reporting.

The driving factors for eHealth in this case are improving access to health care for the citizens, and improving the quality of that care. Classic examples of eHealth include provision of telemedicine services to remote areas, and asynchronous consultations such as via e-mail for access to medical advice.

A national plan for a country in this context should focus on making the case for eHealth, creating awareness and establishing a foundation for investment, workforce education and adoption of eHealth in priority systems and services. There is a common misconception that countries can "leapfrog" to more advanced eHealth systems. But without a parallel focus on creating the enabling environment, innovations in ICT will stay isolated and have only a limited impact on health.

II. Developing and building up

Now consider as a second example, another country where the national context is characterized by a more rapidly developing ICT environment, with a slowly progressing enabling environment. Here, eHealth is still project-based, but projects are larger and there is greater awareness of their potential. The context is characterized by the appearance of eHealth "systems" such as for health information, supply-chain management, and electronic medical records, that remain vertical, fragmented and unable to scale up. There is growth – often rapid – in the commercial ICT market, with important and visible effort on the part of the ICT sector to attract international vendors, who predominate.

In this country example there is broader use of ICT in the general population, and increasing uptake in other sectors as e-government, e-banking and other commercial ICT services begin to take hold. Local vendors start to emerge, and government interest is growing. There is a lot of activity, learning by doing, and significant project risk due to lack of standardization and commitment to long-term investment.

Aid agencies and donors are still active funders, with more private-sector involvement, and pockets of government investment seen in areas such as research and development in high-performance technologies. Public-private partnerships are characteristic of this context, and eHealth is still seen as part of a broader effort to expand ICT and economic development in general.

In this context, ICT can be a driver of development, with an increasing emphasis on competition and expansion of services by the private sector. The health sector lags behind other sectors, with limited awareness and adoption of ICT on a systematic basis to meet health needs. eHealth applications such as telemedicine can deliver valuable services, and first successes and impacts on health outcomes are often seen here.

However, due to the inadequate enabling environment, scaling up is not possible, so the health impact remains limited. Health development aid may be focused on strengthening health information systems (HIS) and some countries may already have an HIS strategy in place. International obligations for public health reporting can sometimes be met in the current environment, but a concerted and often costly effort (not always sustainable or cost-effective) is required to establish and manage the performance of these vertical systems.

Major drivers for eHealth in this environment are access to care and quality of care. Examples of eHealth include more extensive telemedicine networks, adoption of electronic medical record (EMR) systems on a limited scale, procurement and supply tracking systems, and mobile-health trials for medication management and appointment reminders.

A national plan for a country in this context should focus on strengthening the enabling environment for eHealth, creating legal certainty, establishing the policy context for delivering eHealth services more broadly, and identifying the standards to be adopted to ensure that building ever-larger vertical systems is avoided.

III. Scale up and mainstreaming

In our third country example, the eHealth context is characterized by the enabling environment catching up with the ICT environment. Here, eHealth can move to scale, as there is typically a policy basis for investment, protecting citizens and industry more substantially. The enabling environment encompasses aspects that can only be undertaken at the national level, including adoption of standards and laws, incorporation of ICT in health services, and investment and policies for developing a capable workforce.

The commercial ICT market is well established with larger international and local vendors. The health sector takes a leading role in planning and utilizing eHealth to deliver on health objectives, moving beyond the basics of establishing core infrastructure and services to incorporating eHealth fully into standard service delivery models. The health ICT industry is active, with a strong market for services, leading to new business models and competition. Paid services are commonplace, and insurance reimbursement is increasing. There is broad uptake of ICT by the general public, and health professionals are already introduced in some ways to ICT. Thus, the public is exposed to more e-services, and expects them to be delivered.

As eHealth becomes mainstreamed, new businesses emerge and economic opportunities emerge with platforms for innovation and development of new services, including those for other markets. International obligations for public health reporting can now be met with systems and processes being put in place on a broad scale. Health information systems are increasingly linked, but still face problems due to legacy systems and difficulties in linking vertical systems that have been developed at different times and with different technologies.

Drivers for eHealth in this environment are cost and quality. Health systems are often cost-burdened and both quality conscious and safety conscious, so here, efficiency in systems and processes is sought. Examples of eHealth include hospital and care networks (including electronic health records), home health monitoring, chronic disease management applications, and tailored online services for self-management of health records.

A national plan for a country in this context should focus on ensuring the following:

- interoperability and adoption of standards;
- providing incentives for innovation and integration of eHealth into core services;
- identifying funding for medium-to-long term implementation;
- responding to the expectations of citizens for more efficient, effective and personalized services;
- using data and information for public health planning, policies for privacy and security of information;
- undertaking monitoring and evaluation to ensure that eHealth delivers according to health priorities.

Table 2. National context for eHealth development: summary

Context	Characteristics
I. Experimentation and early adoption	• eHealth is project-based with initiatives usually small, few in number and disconnected • Projects are proof-of-concept pilots where ICT is introduced in a limited context • Projects are rarely sustainable due to the lack of infrastructure, skills and integration • The commercial ICT market is fragmented with little local expertise available • Funding and technical support is often provided by aid agencies, donors and external actors • International obligations for public health reporting cannot be met
II. Developing and building up	• eHealth is still project-based, but larger in scale with greater awareness of its potential • eHealth systems (e.g. health information systems, supply-chain management systems, electronic medical records systems) emerge, but remain vertical, fragmented and unable to scale up • Growth occurs in the commercial ICT market, with significant effort to attract international ICT vendors. Local vendors emerge and government interest grows • Initiatives such as e-government, e-banking and other commercial ICT services begin to take hold; but the health sector lags behind • There is a lot of activity, learning by doing, and significant project risk • Aid agencies and donors are still active funders; there is more private sector and government investment in development and adoption of cost-effective technologies • Public-private partnerships increase in number • eHealth is viewed as part of a broader effort to expand ICT and economic development • Early successes are promising, but scale-up is not possible and health impact remains limited • International obligations for public health reporting can sometimes be met through vertical systems • Examples of eHealth include more extensive telemedicine networks, adoption of EMR systems on a limited basis, procurement and stock tracking systems, and mHealth trials
III. Scale up and mainstreaming	• Investment and adoption scales up with a more comprehensive policy basis • The commercial ICT market is well established with larger vendors, both international and local • The health sector takes a leading role in planning and using eHealth to deliver on health objectives • The health ICT industry is active; with new business models and competition, paid services commonplace, and insurance reimbursement increasing • New businesses and economic opportunities arise; there are new platforms for innovation and services, including for other markets • International obligations for public health reporting can be met • Health information systems are increasingly linked, but still face problems due to legacy systems • Examples of eHealth include hospital and care networks, home health monitoring, chronic disease management applications, and tailored online services for self-management of health records

Implications for a national eHealth vision

The country context, at whichever stage that is reflected in the three examples given above, affects the starting point, potential goals, stakeholders, direction and focus of a national eHealth strategy. Understanding this context will help shape the vision of what can be achieved, the focus of activities and the magnitude of investment required (Table 3). For example, countries just beginning eHealth deployment may focus on a limited set of objectives in a priority area, such as improving health information systems and communication infrastructure to link health facilities. At a later stage, these countries may focus on adopting standards and establishing shared processes to expand the scale of successful eHealth projects. Once these efforts have delivered concrete results, countries may move to expand and mainstream services further, thus improving cohesion, efficiency and quality on a broader scale. A comprehensive approach is longer term and ensures that core elements are in place. A focused plan comprises a limited set of challenges that are addressed over a shorter time period. A national eHealth strategy adds value at all of these stages.

Table 3. Context and focus of eHealth strategy

Context	Example focus	Example actions
I. Experimentation and early adoption	Strengthen infrastructure; establish core services and platforms; engage investors; make the case for eHealth.	• Create awareness of eHealth; highlight outcomes of successful pilots and proof-of-concept projects • Make the case for eHealth investment in priority areas • Establish initial mechanisms for national eHealth governance, coordination and cooperation • Establish a foundation for investment, workforce education and adoption of eHealth in priority systems and services
II. Developing and building up	Strengthen and link core systems; create a foundation for investment; ensure legal certainty; strengthen the eHealth enabling environment.	• Establish eHealth data and interoperability standards, and associated compliance and accreditation mechanisms • Establish the policy context to support investment in and adoption of ICT in health services • Address legislative requirements and barriers (e.g. data protection and privacy) • Implement changes to education and training programmes to improve eHealth workforce capability and capacity • Secure long-term funding for investment in national eHealth infrastructure and services • Establish national eHealth planning processes, which have broader cross-sectoral stakeholder representation and participation
III. Scale up and mainstreaming	Focus on scale up and integration of services; cost-effectiveness of investments; incentives for quality and broader adoption; policies for privacy, security, innovation.	• Ensure broad adoption of standards by health ICT vendors • Continue development of data and interoperability standards to support broader and deeper types of health information flows • Create incentives for integration of eHealth into core health services • Provide education and awareness programmes to health-care providers and citizens • Respond to expectations of citizens for more efficient, effective and personalised services • Leverage emerging health information data sources to support public health planning, management and monitoring • Undertake evaluation and monitoring to ensure that eHealth delivers according to health priorities

eHealth components

The national eHealth environment is made up of components, or building blocks (Figure 2), which will be introduced or strengthened through the eHealth strategy.

Figure 2. eHealth components

Leadership and governance

Strategy and investment

Services and applications

Standards & interoperability

Infrastructure

Legislation, policy and compliance

Workforce
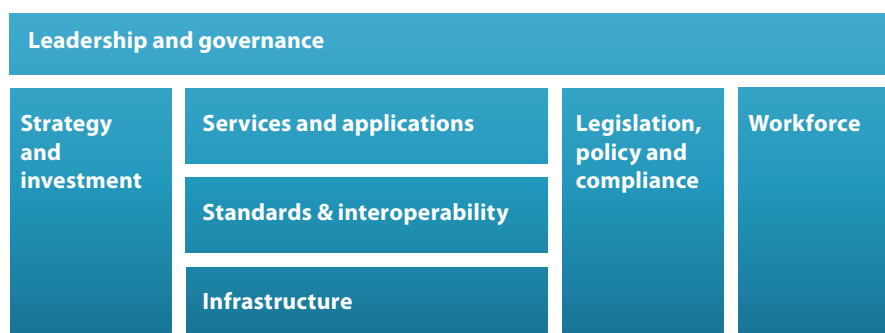
The components can be grouped into the ICT environment and the enabling environment (Table 4).

Table 4. Role of eHealth components

Component	Role	Description
Leadership, governance and multi-sector engagement	Enabling environment	• Direct and coordinate eHealth at the national level; ensure alignment with health goals and political support; promote awareness and engage stakeholders. • Use mechanisms, expertise, coordination and partnerships to develop or adopt eHealth components (e.g. standards). • Support and empower required change, implementation of recommendations and monitoring results for delivery of expected benefits.
Strategy and investment	Enabling environment	• Ensure a responsive strategy and plan for the national eHealth environment. Lead planning, with involvement of major stakeholders and sectors. • Align financing with priorities; donor, government and private-sector funding identified for medium term.
Legislation, policy and compliance	Enabling environment	• Adopt national policies and legislation in priority areas; review sectoral policies for alignment and comprehensiveness; establish regular policy reviews. • Create a legal and enforcement environment to establish trust and protection for consumers and industry in eHealth practice and systems.
Workforce	Enabling environment	• Make eHealth knowledge and skills available through internal expertise, technical cooperation or the private sector. • Build national, regional and specialized networks for eHealth implementation. • Establish eHealth education and training programmes for health workforce capacity building.
Standards and interoperability	Enabling environment	• Introduce standards that enable consistent and accurate collection and exchange of health information across health systems and services.
Infrastructure	ICT environment	• Form the foundations for electronic information exchange across geographical and health-sector boundaries. This includes the physical infrastructure (e.g. networks), core services and applications that underpin a national eHealth environment.
Services and applications	ICT environment	• Provide tangible means for enabling services and systems; access to, and exchange and management of information and content. Users include the general public, patients, providers, insurance, and others. The means may be supplied by government or commercially.

CHAPTER 2
Framework for a national eHealth vision

A national eHealth vision explains why a national approach to eHealth is needed, what a national eHealth plan will achieve, and how it will be done (Figure 3). Answering these questions constitutes the major work of strategy development.

Figure 3. A framework for a national eHealth vision

Strategic context ➡ **Rationale for eHealth**

- Population health
- Health system status
- Health strategy, goals and priorities
- Economic and social development goals
- Goals and challenges
- Implications for eHealth

eHealth vision ➡ **Desired outcomes**

- eHealth outcomes for the health system
- Changes and impact on key stakeholder groups

Required components ➡ **Foundations for change**

- Leadership and governance
- Strategy and investment
- ICT services and applications
- Infrastructure
- Standards and interoperability
- Legislation, policy and compliance
- Workforce

2.1   Strategic context

A national eHealth vision emerges from the broader context of a country's health and development goals, providing the rationale for why eHealth is needed. Governments using this Toolkit already have a preliminary basis for undertaking a national strategy development process. This step confirms that rationale, and ensures that the broader context is also considered.

The strategic context includes:

▶ current and likely direction of population health, and of specific populations

▶ structure and status of the health system

▶ national health strategy, goals and priorities

▶ national development priorities (social and economic).

Elaborating the health goals and challenges helps to identify specific areas where investing in ICT can add value for health; the national development context (e.g. economic growth, innovation), and shows how eHealth will also support development or market objectives. Together, these aspects constitute the strategic context for the national eHealth vision.

2.2   eHealth vision

Going from 'context' to 'vision' requires making the link between why a national approach to eHealth is required, and what eHealth will achieve. The strategic vision describes a national health system that has been enabled by eHealth. It shows how eHealth will be used to respond to the health system's priority goals and challenges, by achieving eHealth outcomes. It answers the question of where does the country want to go with health and how eHealth will help get it there.

The vision statement serves as a high-level message that health sector leaders can adopt and communicate to their constituencies. It should be meaningful and understandable to important stakeholder groups, particularly in terms of what the vision will mean for them.

2.3   Required components

The required eHealth components are the building blocks that need to be put in place to achieve the vision. Comparing the required components with the current eHealth environment shows what is already in place, and what is still needed. This will enable the formulation of recommendations to be used as the starting point of a national eHealth action plan, which is the focus of Part 2.

2.4   Suggested structure

A suggested structure for a national eHealth vision document, which can be modified for the intended audience, is provided in Annex C.

CHAPTER 3
National eHealth vision: overview of the method

The Toolkit method is based on experience and lessons from countries that have already developed a national strategy (Figure 4). A successful outcome requires effective leadership, a well-managed process and stakeholder engagement. The vision is developed through an iterative approach, which ensures it is grounded in the current context, yet is not overly constrained.

First, an initial 'unconstrained' vision is drafted, based on a review of health system goals, challenges and relevant international trends and best practices. Next, the vision is refined, based on an analysis of the current eHealth environment, including opportunities and gaps. Recommendations are drawn up which reflect priorities and resources, in preparation for Part 2: the development of an implementation plan. This chapter summarizes the steps. Details are provided in Chapters 4–12 and a summary table in Annex E.

Figure 4. Method for developing a national eHealth vision
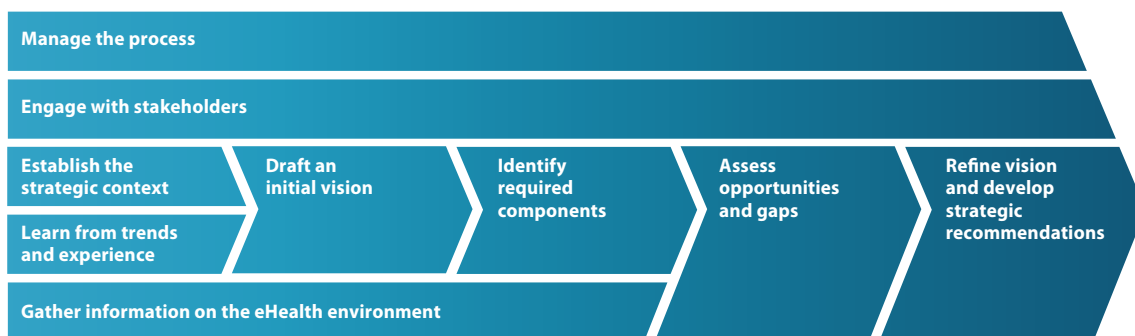
3.1 Manage the process

The vision development process requires establishing the plan for conducting the process (gathering information, drafting); mechanisms for approving and endorsing the vision; and ensuring that consultation and communication with stakeholders is well managed. A successful outcome requires on-going leadership and support, appropriate governance mechanisms, and a core team with technical knowledge, analytical ability and excellent communication skills.

3.2 Engage with stakeholders

Producing a national eHealth vision that is well researched and supported requires working with a range of multisectoral stakeholders, consistent with the government's role in eHealth. An inclusive approach builds relationships and educates stakeholders, while gaining valuable perspectives on what eHealth should deliver. This engagement is carried on throughout the vision development process, to ensure that stakeholders' interests are understood, that they remain informed on progress, and that the vision has their continued support. This support will be instrumental in developing and implementing a national action plan.

3.3   Establish the strategic context

The development of a national eHealth vision begins by establishing the strategic context, which describes the health system goals and challenges that eHealth can help to address. The strategic context is developed by researching population health, the current health system, and broader health and development goals. The non-health context is also considered, to the extent that social and development goals have implications for eHealth.

3.4   Learn from trends and experience

Research into the eHealth experience of other countries (including both successes and failures), as well as trends and best practice, provides an understanding of the outcomes that can be achieved, and the types of goals for which eHealth is relevant. Some eHealth practices are driven by major shifts in technology; others by concerns about cost, quality and access; still others by citizens' needs and preferences, or by market incentives. Investing time in this research is critical to gain an appreciation of the potential technologies, challenges and risks that should be considered in planning. Since formulating a strategy requires a judgement about the future, planners should also become familiar with new ICTs, their common elements, and their potential use in country settings.

3.5   Draft an initial vision

An initial vision for eHealth is drafted once the strategic context has been defined and eHealth trends, experience and best practice have been reviewed. The initial vision is 'unconstrained', meaning that the limitations of the current eHealth environment are not considered at this stage. This approach enables governments to understand what an ideal national eHealth environment could provide in their own context, and avoids a typical focus on the current environment alone. It also enables a more comprehensive view of opportunities that could be pursued at a later date. Finally, it may indicate whether an incremental approach is sufficient to develop the national eHealth environment, or whether a larger scale change may be required.

3.6   Identify required components

Once the initial vision for the national eHealth environment has been defined, it becomes possible to identify the eHealth components, or building blocks, required to deliver the vision. These components include: leadership and governance; strategy and investment; workforce, standards, legislation and policy; and infrastructure and services.

3.7   Gather information on the eHealth environment

This stage focuses on determining which eHealth components already exist or will be delivered during the timeframe being considered. This includes identifying traditional eHealth components (such as existing health information systems and sources), as well as components used by other parts of the public and private sectors, which could be re-used or shared (such as eGovernment components, private sector information systems, or data assets). This type of information will be used to refine the initial eHealth vision and to create a better balance between aspiration and pragmatism.

3.8   Assess opportunities and gaps

This stage combines the knowledge of the required eHealth components and current eHealth environment in order to identify opportunities where existing or planned eHealth components can be re-used or shared; gaps that will need to be addressed to deliver the vision; and other potential risks and barriers to the achievement of a national eHealth environment.

3.9   Refine the vision and develop strategic recommendations

The vision is refined, based on the opportunities, gaps, risks and barriers, and a set of strategic recommendations is developed. These form the primary input to Part 2 of the Toolkit. This stage also includes endorsement of the final eHealth vision and its subsequent communication to the broader stakeholder community.

CHAPTER 4
Manage the process

This process focuses on the effective management of the development of a national eHealth vision.

| Manage the process |
| Engage with stakeholders |

| Establish the strategic context | Draft an initial vision | Identify required components | Assess opportunities and gaps | Refine vision and develop strategic recommendations |
| Learn from trends and experience | | | | |

| Gather information on the eHealth environment |
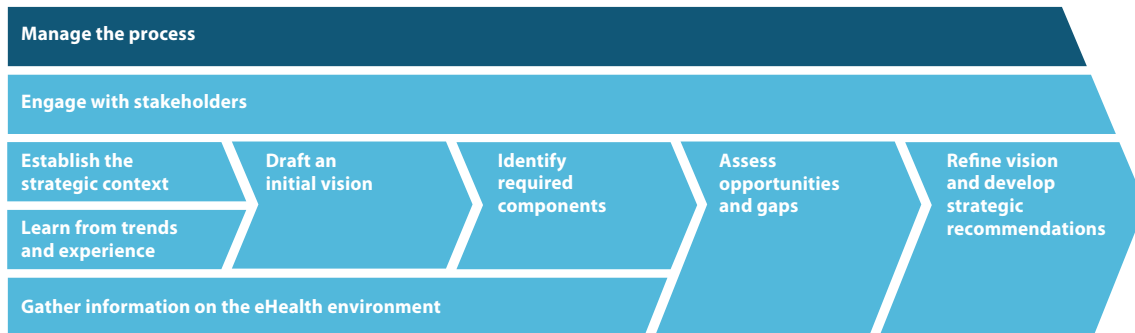
Objective

Effective leadership and governance of the vision development process improves transparency and credibility, facilitates guidance, and ensures that mechanisms for approving, endorsing and owning the national eHealth vision are in place. Effective management ensures that the process is undertaken in a structured and timely manner with appropriate stakeholder consultation.

Activities

The process requires establishing or ensuring:

▶ high-level health sector leadership and support

▶ appropriate governance structure and mechanisms

▶ a multi-disciplinary project team with the requisite skills and expertise

▶ an agreed timeline and resources for completing the work.

Outputs

A credible, well-managed process resulting in a national eHealth vision that supports the national health agenda and reflects the needs of health system stakeholders.

4.1   Health leadership and support

National planning processes, particularly significant reform or transformation initiatives, require sustained leadership and commitment from senior government officials and health-sector leaders. Development of a national eHealth vision often launches a country's formal programme in eHealth. The strategy development and implementation process benefits from a credible and respected leader, or leadership team, which actively and visibly champions the effort. This sends a clear message that the national eHealth vision is being driven by the health sector for the health sector. The leadership team secures the funding and resources required to develop the vision, and assists in resolving major issues and challenges that may arise.

4.2   Governance structure and mechanisms

The governance structure and roles should be set up early in the vision development process to gain credibility, coordinate efforts and establish the necessary expert and reference groups.

A governance mechanism is a committee, council, task force or special group that has the mandate or responsibility to perform one or more of the functions below.

- ▶ Oversight and steering (i.e. input, escalation, review and endorsement of deliverables)
- ▶ Project management (i.e. progress monitoring, financials, risk management)
- ▶ Subject-matter (expert) input across domains such as:
  - national health system and services delivery, including health workforce and budget
  - population health
  - national health strategy and policy
  - current health ICT and eHealth environment
  - other sectors including national infrastructure, telecommunications, education and workforce capacity building, finance, etc.
- ▶ Stakeholder engagement and consultation
- ▶ Communications management.

The structure, reporting or accountability mechanisms can be flexible according to organizational or ministerial structure, and the desired management of the process. See Figure 5 for an example of a governance structure, and a description of roles in Table 5.

Figure 5. Sample governance model for the development of a national eHealth vision

Table 5. Examples of governance functions, responsibilities and composition

Group	Responsibilities	Composition
Health sector leadership	• Gives overall direction, oversight and mandate • Secures spending authority and resources • Acts as the vocal and visible champion • Assists with resolution of major issues, problems, conflicts and other challenges	• Senior-level health sector decision-makers, such as the Minister of Health or the national health policy and strategy council.
Steering committee	• Acts individually and collectively as a vocal and visible champion through its representative organizations • Provides direction and guidance to the core team • Approves, endorses and owns the national eHealth vision • Makes decisions at key stages of the project • Assists in addressing risks, resolving issues and conflicts • Oversees overall progress, and approves changes to scope or approach	• Those individuals who should be involved in making decisions in relation to development of the national eHealth vision, the acceptance of the vision, and the progression of its recommendations, including representatives from ministries of health and ICT.
Stakeholder reference and expert advisory groups	• Provides guidance on the development of outcomes and recommendations, and supports the development of the national eHealth vision • Assists in identification of existing or planned eHealth components, and their re-use or sharing • Provides input into the development of eHealth governance model • Provides insights into the implications of strategic directions and recommendations for the stakeholder groups • Reviews and provides feedback on findings, conclusions, and draft deliverables	• Academics, thought leaders and health sector representatives. Not involved directly in decision-making but able to exert a high degree of influence due to their acknowledged expertise in the field and/or their role as formal or informal advisers to key decision-makers. • An expert advisory group is a small group of industry, sector or issue experts who are asked to provide technical input and advice. • This group should be established early in the project, because it can take time to identify individuals or representatives from key organizations who will participate.
eHealth strategy team	• Planning and management of the vision development process. • Information gathering, analysis and drafting of the national eHealth vision • Stakeholder research and consultation	• Individuals skilled and experienced in the management and delivery of large-scale health sector strategy.
Broader stakeholder environment	• Providing input to the development of the national eHealth vision • Providing feedback on deliverables that have been socialized or published	• Individuals or organizations that are impacted by, or have a particular interest in eHealth and the outcomes of the process.

The complexity of the nation's health system and the associated stakeholder environment will determine the number of individuals required in each group. This is particularly the case for the eHealth strategy team as the effort associated with coordinating, management and consultation is directly related to the complexity and size of the stakeholder environment.

4.3 Core strategy team

This Toolkit takes a project-based approach to development of a national eHealth vision, which is a complex undertaking requiring knowledge and expertise across several disciplines. Not all countries will have the expertise within the health sector to undertake the process. The core strategy team should have health system and public health expertise as a starting point, and can draw from other government agencies and the private sector as required.

The core project team should include or have access to the following skills, knowledge and expertise:

- ▶ understanding of the national health sector needs and challenges;
- ▶ ability to research, analyse and extract lessons from international programmes and projects;
- ▶ strategic analysis, planning skills and experience at the national level;
- ▶ broad experience in working with stakeholders and communicating with broader constituencies;
- ▶ broad knowledge of ICT, eHealth, its components and its application in the sector;
- ▶ senior health sector, ministerial or government representatives should also be in the team.

4.4   Timeline and milestones

The timeframe for developing a national eHealth vision can vary significantly, based on factors such as the size and structure of the health system, the level of engagement and support sought, the scope of the strategy, and the resources available for the process. Developing a realistic project plan and updating it regularly is important to managing the project successfully. Taking time to develop this plan enables the project team to understand the expectations of the steering committee and decision-makers, and to keep them informed as the project progresses. It also helps forge a common view across the team, enables coherence between different strands of the project, and helps to anticipate long lead-time activities. Planning for internal (team) coordination and communication, project documentation and management should be conducted at an early stage.

The figure below shows two examples of the duration and timing of the steps to be completed (Figure 6), varying between 12–19 weeks.

Figure 6. Two sample timelines for developing a national eHealth vision

Stage	Week																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Manage the process																			
Engage with stakeholders																			
Establish the strategic context																			
Learn from eHealth trends																			
Draft an initial vision																			
Identify required components																			
Gather information on the eHealth environment																			
Assess opportunities and gaps																			
Refine vision and develop recommendations																			

Legend:
- **Upper expected timeframe**
- **Lower expected timeframe**
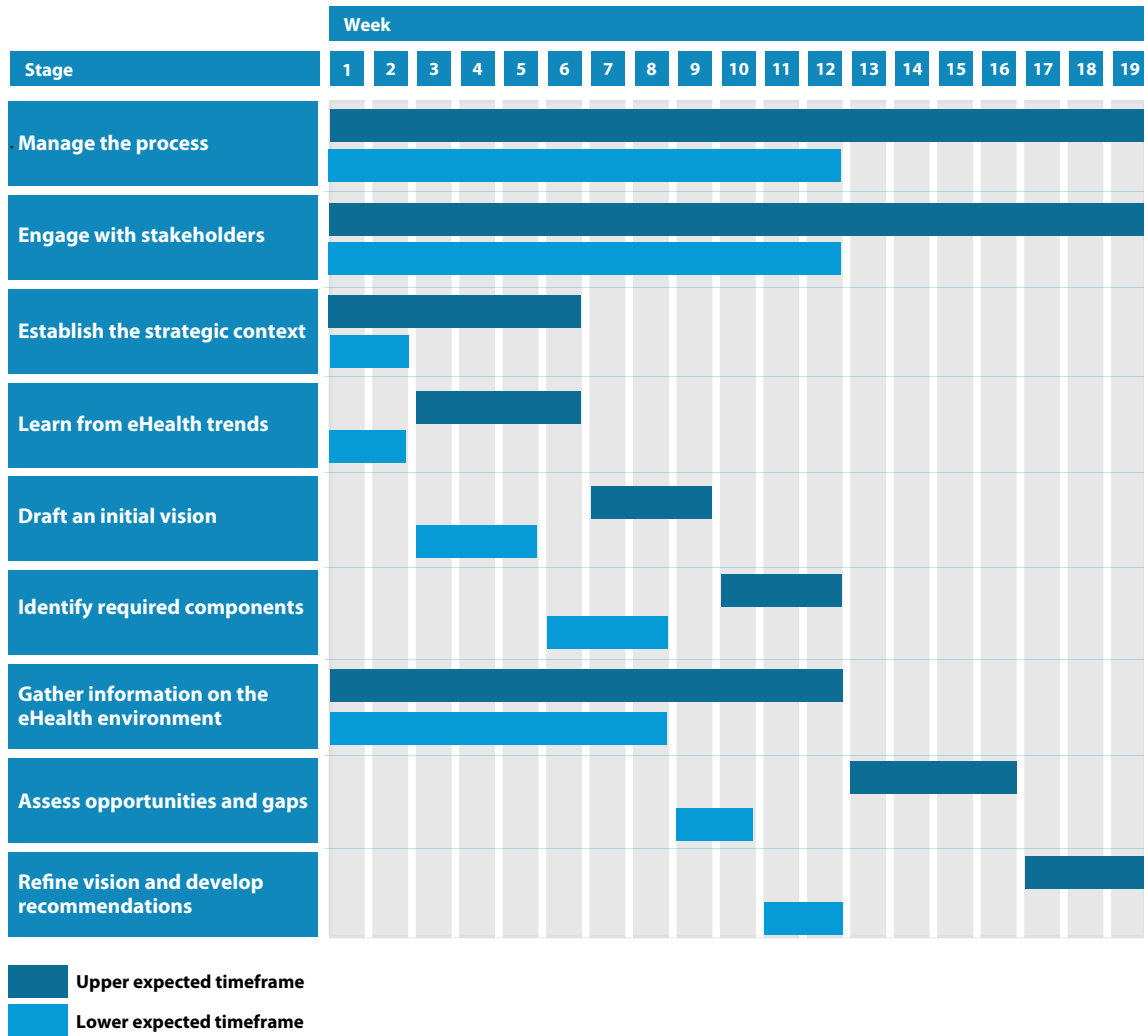
CHAPTER 5
Engage with stakeholders

This process focuses on ensuring effective collaboration with stakeholders during the development of a national eHealth vision.

| Manage the process |
| Engage with stakeholders |

Establish the strategic context	Draft an initial vision	Identify required components	Assess opportunities and gaps	Refine vision and develop strategic recommendations
Learn from trends and experience				
Gather information on the eHealth environment				
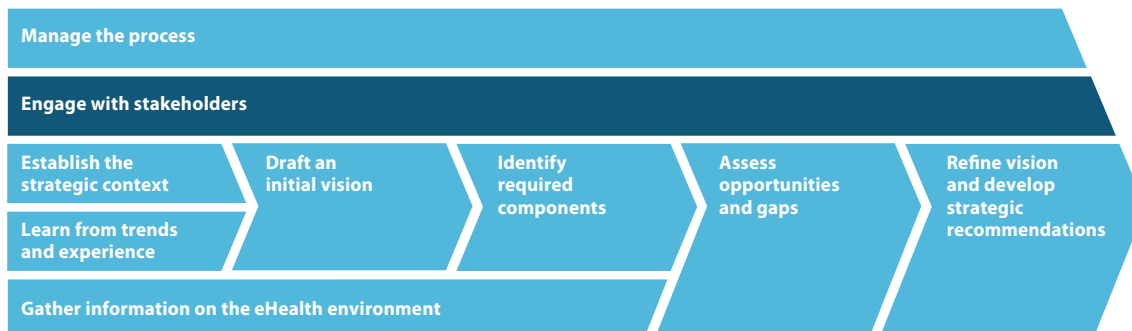
Objective

Producing a national eHealth vision that is well researched and supported requires working with a range of multisectoral stakeholders, consistent with the government's role in eHealth. There is likely to be a number of stakeholder groups with an interest in a national eHealth vision, which are keen to provide input and follow its progress. Careful management of them is critical to ensure that the vision has appropriate input, support and acceptance. An inclusive approach builds relationships and educates stakeholders while gaining valuable perspectives on what eHealth should deliver. This engagement is carried on throughout the process to ensure that stakeholders' interests are understood, that they remain informed on progress, and that the vision has their continued support.

Activities

Given the range of stakeholders that may need to be involved, working with them can be a complex undertaking. Managing this complexity requires:

▶ clarifying the role of government in national eHealth development;

▶ identifying the stakeholder groups that may need to be involved;

▶ developing a pragmatic approach to managing these groups, taking into account influence, knowledge, and expertise; and

▶ defining the points at which consultation will occur, ensuring this is communicated to stakeholders and carried out as planned.

Outputs

An informed national eHealth vision that is relevant to, and supported by, stakeholders.

5.1   The role of government

Strategy development processes vary considerably according to the country context and the role of government. Some strategies are precisely directed, others emerge in a more collaborative way. This step clarifies the government's role and the main partners in eHealth development. The role of the government will have a direct bearing on how the eHealth vision is developed and the nature and level of stakeholder involvement (see Annex F, Governance continuum). The implications for strategy and planning are outlined below (Table 6). Clarifying the government's role will also facilitate, at a later stage, an understanding of the spectrum of interventions, actions or policy levers that are available to support eHealth.

Table 6. Government's role and implications for strategy and planning

Market	Description	Implications for planning
Fully regulated	Government drives the development and adoption of eHealth from a central mandate. eHealth is generally implemented through large-scale national or state programmes and projects.	• Government is responsible for developing the national eHealth vision. • Limited stakeholder consultation is conducted on the current eHealth environment and feedback on the national vision; the content of the plan is primarily driven by the government.
Guided market	Government provides central coordination of eHealth in areas of national significance. There is greater flexibility and reduced central control and regulation in areas where the health sector and market are best positioned to play a role in developing the eHealth environment.	• Government is responsible for leading and managing the development of the national eHealth vision. • Government works with stakeholders to develop the strategic context, vision and supporting recommendations. Stakeholders may provide subject matter expertise on the current and future eHealth environment. • Content of the plan is driven by both the government and important multi-sector stakeholders.
Free market	Government provides no central authority or governance over the development of the national eHealth environment. There is heavy reliance on external parties (such as customers, care providers, and suppliers) to cooperate and collaborate with each other to develop the national eHealth environment.	• Government facilitates the process by which stakeholders are brought together to develop the national eHealth vision. • Government does not provide significant input or content, but may play a facilitating and advisory role to assist in the development of a national eHealth vision, which different stakeholders will endorse.

5.2   Identify and understand the stakeholders

Health and non-health sector stakeholders should be identified and their interests, expectations and values explored. Taking time to understand their perspectives will enable a more comprehensive picture to emerge of the technical, political and social context, and the acceptability of potential strategic directions. It will also help in forming the case for eHealth in terms of what benefits may be delivered to each stakeholder group, and how that group should be involved in the planning and delivery of the vision itself.

Stakeholders from the health sector include:

▶ health professional associations

▶ hospital and health-services associations

▶ academic, research institutes and think-tanks

▶ health and disability insurance entities

- patient associations and advocacy groups
- general public
- national, state and local public health and health-care authorities
- private care providers including private health organizations, nongovernmental associations and charitable affiliates
- health ICT vendors (local, national and international firms)
- media – national and local, general and specialized (e.g. health-care).

Stakeholders from beyond the health sector also play an important role in developing and implementing the vision, (e.g. expertise or services), or may benefit directly (e.g. through new business opportunities). Examples include:

- national civil services, vital registration and statistics offices
- ICT/telecommunications ministries
- private sector ICT infrastructure and service providers
- education, social welfare and community services
- defence and civil protection entities
- innovation, industry and science institutes and ministries
- treasury and finance institutions
- international organizations and donors such as the European Commission, the World Bank, the International Monetary Fund and United Nations specialized agencies.

These stakeholders should be analysed to inform the engagement process and communication plan.

- What are the main concerns, interests, mandate, experience and views of each stakeholder group?
- How supportive and influential is each group?
- What expertise and/or resources may be available for the present strategy development, as well as for implementation of the action plan?
- What should be the role of each and how should they be involved (Figure 7)?
- Are there stakeholders that are not 'organized' but whose interests should be considered?

Understanding the different stakeholders makes it possible to determine the level, focus, frequency and medium of engagement to use. Their interests, level of influence, and potential contribution should be well understood before the start of communication. Research on stakeholder interests and capabilities is useful not only for the strategy development process, but will also be required for Part 2, implementation planning.

The strategy team will need to decide how to prioritize its efforts and how to engage most effectively, particularly with those stakeholders most affected by the strategy, or most capable of influencing it and its implementation. Serving the true customers of the strategy is as critical as achieving buy-in for the vision.

5.3 Clarify stakeholder roles

Stakeholders may be characterized by the role, contribution, level of influence and interest that each is likely to have in the development of a national eHealth vision. Understanding these aspects will enable strategic engagement of key groups at the right points in the process (Figure 7, Table 7).

Figure 7. Four common stakeholder roles in the development of a national eHealth vision

Broader stakeholders and general public
Individuals, carers, families, community groups, employers

Engaged stakeholders
Advocacy groups, health executives, insurers, patient associations

Key influencers
Advisers, academics, and senior executives in health, funding and investment organizations

Decision-makers
National eHealth steering committee
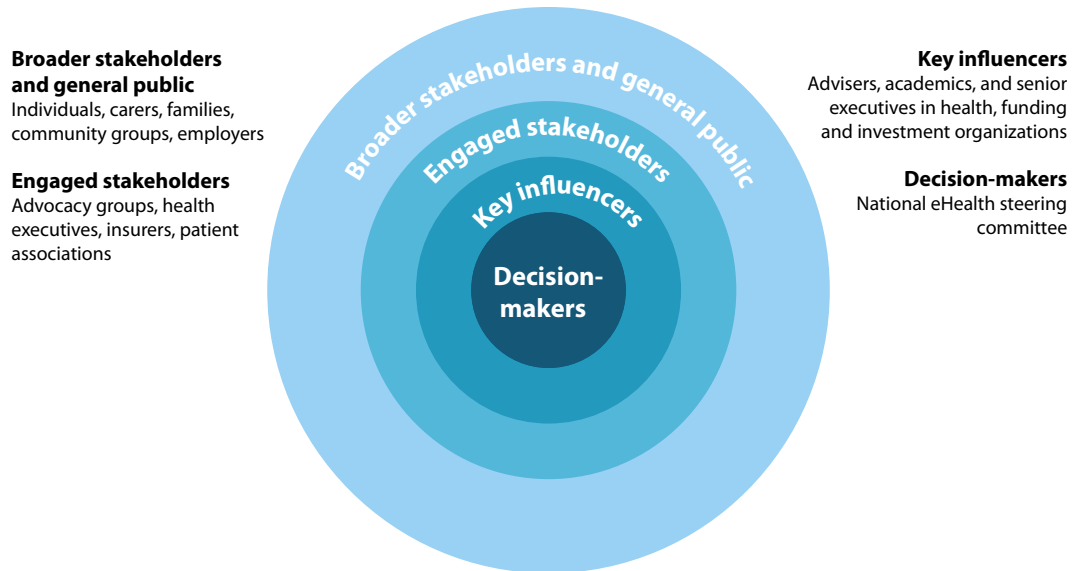
Table 7. Stakeholder roles in a national vision

Role	Description	Examples
Decision-makers	They set the overall vision and strategic direction, guiding the vision and planning process. They are responsible for approving, endorsing and owning the national eHealth vision and carrying out strategic recommendations.	• National eHealth steering committee • Other government committees or councils to which the steering committee reports (e.g. the steering committee may be a subset of a broader health and/or ICT council).
Key influencers	They are not involved directly in decision-making but are highly influential in decisions relating to the national eHealth vision. This is due to their acknowledged eminence and expertise in the field; and their role as formal or informal advisers to key decision-makers.	• Senior executives in key health organizations • Senior executives in funding and investment organizations • Eminent academics and experts • Other advisers to steering committee members and other relevant government committees and councils
Engaged stakeholders	They are not involved in, nor have influence on, decision-making, but are a source of subject matter expertise. They have a strong interest in the national eHealth vision because of the impact it will have on them and/or their organization.	• Members of advocacy groups (e.g. privacy, public, vendors, industry, unions, etc.) • Patient associations and advocacy groups • Health agency executives (e.g. NGOs, hospitals, etc.) • Health committees and programmes
Broader stakeholders and general public	There may be sections of the general public who are aware of developments in eHealth and are interested in the potential impacts on them. There may also be a requirement to ask the general public to provide input or endorsement of components of the national eHealth vision.	• Individuals • Carers • Families • Community groups

5.4   Determine approach to stakeholder engagement

Each stakeholder group requires a distinct approach to engagement and consultation, taking into account its role (Table 8). Once this has been determined, it can also be used to plan where stakeholders will be consulted during development of the vision.

Stakeholder engagement should be linked to a communications plan that sets out what and how the project team will communicate about the project, including with the media. Mass media outlets may be the only means by which the general public is informed and influenced about it, so these outlets are particularly important if a high public profile is sought. National media or specialized health media may express interest at any stage. Communications with other key groups should be designed according to their level of interest, expertise and support. Channels of communication and the way content is framed should reflect the goals of working with the particular stakeholder group and will link to a later step of this process, when the benefits to stakeholders are outlined.

Table 8. Sample stakeholder engagement approach

Role	Approach to engagement
Decision-makers	Frequent and formal contact to seek input, and guidance, present material for final review, and seek acceptance and endorsement of recommendations.
Key influencers	Frequent and more informal contact to seek input and guidance and assistance in forming key directions and recommendations.
Engaged stakeholders	Initial consultation followed up with structured outward communications at appropriate intervals to advise on process and outcomes.
Broader stakeholders and general public	May be managed through mass media or online questionnaires and surveying techniques. These enable publication of material such as a summary of the eHealth vision, and seek input from the general public through a questionnaire, poll or survey.
	Generally, face-to-face consultations with the general public are not required during the development of the national eHealth vision and action plan, although public consultation forums can be used if needed.

5.5   Define where consultation will occur

The project team should develop a stakeholder consultation plan that describes in detail how, when and for what purpose stakeholders will be engaged. A high-level example is provided in Table 9.

Table 9. Sample stakeholder consultation plan

Stage	Decision-makers	Key influencers	Broader stakeholders	General public
Establish the strategic context for a national eHealth vision	• Consulted to gather input required to develop the strategic context for national eHealth. • Review and endorse strategic health system goals and challenges.	• Consulted to gather input required to develop the strategic context for national eHealth.	• May be consulted to gather input to understanding the challenges facing the national health system and population health.	• May be consulted to gather general public views on the health system challenges that eHealth should be used to resolve.
Identify relevant eHealth trends and best practice	• Consulted to identify international jurisdictions and projects that should be considered or explored as part of research activities.	• Consulted to identify international jurisdictions and projects that should be considered as explored as part of research activities.	• May be consulted as part of identifying compelling uses of eHealth in similar nations and geographical regions.	N/A
Construct an initial vision for national eHealth	• Review and endorse timeframe for the national eHealth vision. • Consulted to provide input into initial national eHealth vision. • Review and endorse initial national eHealth vision.	• Consulted to provide input into initial national eHealth vision. • Consulted to provide input into and shape scenarios that put the eHealth vision into practice.	• May be consulted as part of refining scenarios that put the eHealth vision in practice. • May be provided with an overview of the initial eHealth vision to which they can provide feedback and comments.	N/A
Identify the required eHealth components	• Consulted to provide input into required eHealth components, in particular: leadership and governance; strategy and investment; legislation and policy. • Review and endorse required eHealth components.	• Consulted to provide input into and review required eHealth components, in particular: leadership and governance; strategy and investment; legislation and policy; services and applications; infrastructure.	N/A, not applicable	N/A
Gather information about the current eHealth environment	• Consulted as part of identifying existing or planned eHealth components within the nation's current eHealth environment.	• Consulted as part of identifying existing or planned eHealth components within the nation's current eHealth environment.	• May be consulted to identify existing or planned eHealth components.	N/A
Assess the current state of eHealth for opportunities, gaps and barriers	• Consulted as part of assessment of existing or planned eHealth components within the nation's current eHealth environment. • Review and endorse assessment outcomes (i.e. re-use and sharing opportunities, gaps, risks and barriers).	• Consulted as part of assessment of existing or planned eHealth components within the nation's current eHealth environment.	• May be consulted as part of the assessment of existing or planned eHealth components.	N/A
Refine vision and develop strategic recommendations	• Provide input and guidance to the prioritization of eHealth components that will be delivered over the vision's timeframe. • Provide input and guidance to the development of strategic recommendations. • Review and endorse refined national eHealth vision and strategic recommendations.	• May be consulted to provide additional input and guidance to the prioritization of eHealth components. • Provide input and guidance to the development of strategic recommendations. • Endorsed national eHealth vision and strategic recommendations presented to key influencers not involved in its refinement.	• Broader stakeholders would receive a summary of the refined national eHealth vision as part of the broader socialization process.	• May be provided with an overview of the endorsed eHealth vision as part of broader public awareness and education.

The final plan should take into account the availability of stakeholders, and in particular seek to reduce the number of consultations, interviews and discussions that need to be held with the same stakeholder. This may be accomplished over a number of rounds, rotating the stakeholders involved in each round (Table 10).

Table 10. Sample approach to stakeholder consultations

Round	Focus of engagement and consultation	Proposed mechanism
One	Preliminary consultations would explore questions such as: • What are the priority challenges within the health sector that eHealth may be able to resolve? • Why should we consider investing in eHealth? • What is our vision for eHealth over the next 5–10 years? • What should be the priorities for national eHealth? • What are the risks and barriers to delivering eHealth in our country? • What existing, current or planned initiatives are we aware of that could be a foundation for a national eHealth vision or could be scaled nationally towards the vision? • Which other countries could we learn from and why?	• Individual or small group interviews

Two	• A broader set of consultations would be undertaken to:
	  – Validate and refine initial drafts of the strategic context for eHealth and the initial national eHealth vision
	  – Identify additional health sector challenges and benefits of relevance to eHealth
	  – Explore eHealth components that would be required to deliver the initial national eHealth vision.
		• Group forums and workshops wherever practical to facilitate participation by a larger group of stakeholders.
		• Individual or small group interviews as required where group forums are inappropriate or impractical.

Three	• A set of targeted and focused consultations would be undertaken to:
	  – gather information regarding the nation's current eHealth environment
	  – identify opportunities to re-use or share existing or planned eHealth components
	  – explore and assess model options for eHealth leadership and governance
	  – discuss findings and recommendations with individual decision-makers and stakeholders where required.
		• Scheduled on an as-needed basis
		• Individual interviews and small group forums as appropriate; video conferences and teleconferences, as required.

CHAPTER 6
Establish the strategic context

This stage focuses on the establishing the strategic context for a national eHealth vision.
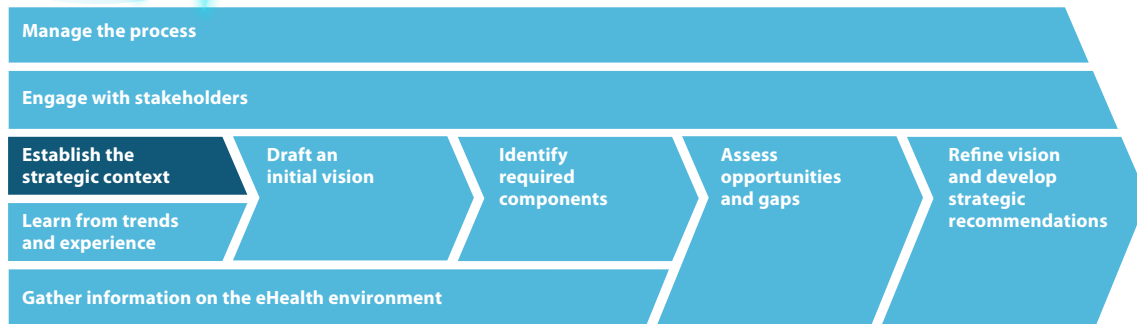
Objective

Developing a national eHealth vision begins by establishing the strategic context, which describes the priority health system goals and challenges that eHealth will help to address. The strategic context is developed by researching population health; the health system; national health strategy, priorities and goals; and social and economic development goals.

Activities

▶ Research population health and demographics.

▶ Describe the health system.

▶ Review the national health strategy, goals and priorities.

▶ Identify economic and social development goals relevant to eHealth.

▶ Identify work already done on strategies for eHealth, ICT or health information systems.

▶ Identify the strategic goals and challenges most directly affected by the eHealth vision.

▶ Describe how a national eHealth environment can support these goals and challenges.

Outputs

▶ The strategic goals and challenges to delivering improved health outcomes, along with an understanding of the relative strategic priorities for the sector.

▶ The potential role for eHealth in addressing these goals and challenges.

6.1   Research population health and demographics

Objective

This step focuses on forming a broad understanding of the health of the population, and how it is expected to change over the next 10–20 years (Table 11).

Table 11. Population health and demographics

Dimension	Sample questions
Size and demographics	• What is the size and age distribution of the current population? • What are the primary geographic, social, economic and other demographic segments (e.g. population living below the poverty line, age groups, literacy, and other relevant indicators)? • How are these various segments expected to change?

Current health outcomes	• What are current health outcomes, such as:
	  – average life expectancy
	  – mortality rates and causes
	  – primary diseases and risk factors, particularly affecting poorer populations
	  – other important national and international health measures?

Implications of demographic trends	• What demographic changes are forecast to occur? • What challenges will these changes create for the health system?
Implications of health outcome trends	• What changes in population health outcomes are forecast to occur? • What health and non-health factors are expected to be responsible for these changes? • What challenges will these changes create for the health system?

Recommended outputs

This step should produce an understanding of:

▶ current population health and demographics, and anticipated changes

▶ the implications of these changes for the health system

▶ specific challenges for segments of the population (age groups, socioeconomic groups, etc.).

Approach

Internal research and analysis, supported by stakeholder interviews.

Internal research and analysis

The project team should use available data and information resources to minimize the time spent on this step. Data should be requested from the national health department and agencies responsible for collecting and publishing the data. Other sources include international agencies, such as WHO, which collect and publish data and country reports. A literature search may identify additional information resources.

Stakeholder interviews

Interviews should be conducted with health ministries, departments and agencies responsible for monitoring and reporting on population health, where internal research has been unable to locate the required information. Additional interviews with ministries, departments and agencies responsible for health planning may also be useful to gain insights into the health and non-health drivers of population health outcomes.

6.2 Describe the health system

Objective

This step focuses on understanding the national health system, including challenges of access, cost and quality of services and its overall management (Table 12).

Table 12. Examples of health system dimensions to be explored

Dimension	Sample questions
Services	• What types of health services[1] are available to citizens? • What health-care services cannot be delivered to the population and what challenges or barriers are responsible for this?
Structure and roles	• Which entities[2] plan, manage and deliver health services at a national, state, regional and local level? • What are the responsibilities of these entities and what are their relationships with each other? • What gaps or challenges exist with the current health system structure?
Workforce	• What is the size, education and distribution of the health workforce? • Where are workforce imbalances occurring, or expected to occur in the future? • What impact will these imbalances have on the health system, services and health outcomes?
Funding	• What is the current expenditure of the national health system?[3] • What model is used to fund the national health system?[4] • What changes in health-care spending and funding models are likely to occur? • What are the funding and budget cycles for the health system, and which entities are involved?[5]
Governance, policy and regulation	• What governance and policy mechanisms exist at a national, state, regional and local level? • What are the relationships and interactions between these mechanisms? • How are regulation and performance monitoring of the health system undertaken?
Effectiveness and efficiency	• What challenges affect the quality and safety of health services? • What challenges affect the effort, time and cost associated with delivering health services?
Accessibility	• What challenges affect the ability of certain population segments to access health services?

Notes:

1   Examples of *health-care* services include primary care, allied health, specialist services, pharmacy, community health, diagnostic and laboratory, acute care, and health services for the aged.

2   Examples may include public health departments, agencies, organizations and providers, private health-care organizations, networks and providers, and nongovernmental organizations (NGOs).

3   Countries may not have this information available. This should not be viewed as a barrier to creating a national eHealth vision. But it may increase the complexity of constructing an economic case for investment in eHealth.

4   Funding models may include taxation, social health insurance, private health insurance, out-of-pocket payments, donor funding.

5   This includes consideration of planning and funding processes for major donors.

Recommended outputs

This step should produce a summary of:

▶ the national health system

▶ health system challenges, and any communicated priorities regarding them

▶ potential challenges to the development of a national eHealth environment.

Approach

Internal research and analysis, supported by interviews with health sector stakeholders.

Internal research and analysis

This step should focus on obtaining information on the national health system. This information should be available from national, state, regional and local health departments and agencies, as well as through Internet-based research. International agencies such as WHO also publish reports on country health systems.

Stakeholder interviews

Health-sector stakeholders should be consulted as part of developing an understanding of the health system and associated challenges. Both broad and specialized perspectives should be sought. Consultation ensures that the necessary information is collected and provides stakeholders with the opportunity to outline their views on the potential role and contribution of eHealth.

6.3   Review health strategy, goals and priorities

Objective

This step focuses on identifying the health strategies, goals and priorities that may exist (Table 13) and distilling them into a common group on which a national eHealth vision can be developed. A national vision cannot be developed until this alignment exists.

Table 13. Examples of health strategy, goals and priorities

Dimension	Sample questions
Challenges	• What are the current challenges to the health system and broader health sector? Areas to consider: - population health - equity and accessibility of care - health workforce supply and distribution - health system structure and organization - effectiveness and efficiency of health-care delivery - emergence of advanced medical treatment regimes - funding, insurance and cost of care.
Priorities	• What are the government's stated priorities for addressing these challenges?
Strategy	• What is the national health strategy? • How recently has the strategy been developed and what is its timeframe?
Goals and targets	• What goals and targets have been identified as part of the national health strategy? • What commitments have been made to achieving international health goals?[1] • What other international obligations, partnerships or programmes are in place?[2]
Timeframes	• What are the timeframes for delivering the health strategy, goals and priorities?
Initiatives	• What major health system improvement, transformation or reforms are underway or planned?
Funding	• What are the implications for future funding of the nation's health system?

Notes:

1   Such as the Millennium Development Goals (MDGs), which UN member states have committed to achieving by 2015.

2   Such as the International Health Regulations (IHR), and the Partnership for Maternal, Newborn and Child Health (PMNCH).

Recommended outputs

The output of this step should be a set of strategic themes, goals and priorities that are supported by the relevant health-sector leaders and decision-makers.

Approach

Countries may not have a well-articulated health strategy, set of goals, or priorities. Often multiple versions of these co-exist at national, state and regional levels. This step will require consultation with health-sector stakeholders to identify and refine these to an agreed set that can be used for the basis of developing a national eHealth vision.

Internal research and analysis

This step should focus on reviewing information on a country's health strategy, goals and priorities. Information may be in the form of a health strategy, reform agenda, or a set of future health-care policies or principles. Sources will depend on the structure and governance of the health system, but will probably be found in national, state, regional and local health departments and agencies.

Stakeholder interviews

Interviews with stakeholders should refine or confirm internal research. Stakeholders responsible for health strategy, planning and policy at a national, state, regional and local level should be selected, including:

- ▶ health strategists and planners from both the public and private sectors
- ▶ health policy-makers
- ▶ politicians and ministers with a health portfolio.

Workshops may need to be conducted where discussion is required to explore and resolve divergent strategies, goals and priorities.

6.4   Identify development goals relevant to eHealth

Objective

This step focuses on determining whether there are important social or economic development goals or commitments that should be considered as part of developing a national eHealth vision. While eHealth strategies are primarily developed to deliver health benefits for countries, they can also be an important mechanism for facilitating cooperation at the regional level and driving investment in ICT infrastructure, research and development. For example, a national eHealth strategy could establish incentives and facilitate the development of technologies for export, promote a new market, or serve as a driver for innovation in the nation's health ICT sector.

Recommended outputs

This step should identify additional non-health sector drivers that are relevant to eHealth and that should be considered in the development of a national eHealth vision.

Approach

Internal analysis followed by validation with high-level sector stakeholders.

Internal analysis

Regional documentation, reports, announcements or cooperation agreements should be obtained from development partners in other ministries, agencies or institutions. These agreements may take the form of policies, major commitments such as the Millennium Development Goals, and instruments such as directives and recommendations used by entities such as the European Commission, for example. These agreements can then be analysed to understand how the development of a national eHealth environment may provide opportunities to align with or to further their goals and targets.

Refinement and validation with stakeholders

Interviews with stakeholders in science, technology, development and related ministries can help validate the findings, shed light on the priorities and timeframe, and clarify how these may inform the development of the national eHealth vision.

6.5 Review existing strategies for eHealth, ICT or health information systems

Objective

This step reviews work done to date and status on strategies related to eHealth. These could be in the area of eHealth (vision statements, goals, policy documents, government mandates or pledges), health information systems, or ICT.

Approach

Internal analysis followed by validation with high-level sector stakeholders.

Internal analysis

Review of health and ICT ministry documentation, including a review of resolutions, mandates, policy statements or commitments. Previous reports or other documentation can yield valuable insights and lessons for the current effort.

Refinement and validation with stakeholders

Interviews with stakeholders and expert groups.

6.6 Select goals and challenges where eHealth will have the most impact

Objective

This step focuses on combining the knowledge gained through the previous steps to identify the strategic goals and challenges that can best be supported by eHealth. While there may be many of these only some will be directly supported by a national eHealth environment. This step aims to identify those where eHealth can have the biggest impact, to be used as the basis for defining the national eHealth vision.

The goals selected may be common across the areas of population health, health system, health strategy, and broader social and economic development, or may be important goals and challenges that have occurred in only one of these areas (Table 14).

Table 14. Strategic goals and challenges: common areas

Area	Sample questions
Population health	• What are the strategic goals for improving the health outcomes of the population? • What challenges will be created by current and expected changes in population health?
Equity and accessibility	• What are the challenges impacting the delivery of equitable and accessible health services across the population?
Health workforce supply and distribution	• What are the challenges facing the supply of the nation's health workforce and its ability to support effective and efficient health-care delivery at all levels of care? • What are the challenges related to the distribution of a nation's health workforce and its ability to support effective and efficient health-care delivery in metropolitan, regional, rural and remote parts of the nation?
Health system structure and organization	• What are the challenges caused by the existing structural, funding, governance and leadership arrangements of the nation's health system?
Effectiveness and efficiency of health-care delivery	• What are the challenges that affect the quality and safety of health services delivered to the population? • What are the challenges affecting the effort, time and cost associated with delivering health services to the population?
Emergence of advanced medical treatment regimes	• What are the opportunities and challenges associated with the emergence of advanced medical treatment regimes and the demand for these by the population and health-care providers?
Funding	• What are the funding challenges for health systems, trends in public and private spending, sustainability of the health system, projected funding and its impact on future health services?

These are just examples, and the specific goals and challenges may differ significantly between countries. However, the process for reaching them is the same.

Recommended outputs

This step should produce a clear description of the main strategic goals and challenges around which the national eHealth vision will be developed.

Approach

Internal analysis followed by validation and refinement with health-sector stakeholders.

Internal analysis

The information collected so far should be consolidated to form a manageable number of strategic goals and challenges around which a national eHealth vision can be constructed. Based on existing country experiences, between five and eight strategic goals and challenges are recommended. More than eight increases the complexity of developing a well-structured, understandable vision and action plan. A large number of goals and challenges should be grouped into a set of *strategic themes*. The vision can then be drafted to respond to these themes.

It is also important to avoid overlap and duplication among goals and challenges. If, for example, one challenge is actually a result of another, the focus should be on the main challenge.

Refinement and validation with stakeholders

The strategic goals and challenges should be reviewed with key stakeholders and refined based on their feedback. This essential step should focus on developing a consensus on the set of themes, goals or challenges around which the national eHealth vision will be constructed. These are just examples, and the specific goals and challenges may differ significantly between countries. However, the process for reaching them is the same.

6.7 Describe how eHealth will support selected goals

Objective

This step explores the relationship between flows of health information, and the goals and challenges identified in the previous step. The focus is on determining how health information flows may need to change. It may also identify how the development of a national eHealth environment could support non-health sector goals and challenges.

'Health information flows' refers to electronic exchange of information within the health sector, and the provision of health services through electronic channels. Exploring a strategic goal or challenge from this perspective helps determine how these flows may need to be improved to enable a goal to be met or a challenge to be overcome. This is a critical step towards understanding what a national eHealth vision has to do to enable or support a health system.

The questions below may assist in understanding the implications of strategic goals and challenges for eHealth.

- ▶ What are the main information flow challenges that currently exist?
- ▶ How do these challenges act as a barrier to achieving a strategic goal or overcoming a strategic challenge?
- ▶ How will the flow of information in the health sector need to change?
- ▶ What information, knowledge and tools would need to be made available to individuals, health-care providers, managers and policy-makers?

Recommended outputs

This step should describe the implications for eHealth arising from the themes identified in the previous step. These should be described in terms of health information flows or the potential impact on other sectors.

Approach

Internal analysis to determine and describe how eHealth will support health and development goals:

- ▶ the strategic goals and challenges for the health system and social and economic development;
- ▶ the implications of these goals and challenges;
- ▶ description of how sharing and access to information and other electronic health services can address health goals;
- ▶ description of how a national eHealth environment may allow non-health goals and challenges to be addressed.

CHAPTER 7
Learn from eHealth trends and experience

This stage focuses on identifying and learning from relevant eHealth trends and experience.

| Manage the process |
| Engage with stakeholders |

| Establish the strategic context | Draft an initial vision | Identify required components | Assess opportunities and gaps | Refine vision and develop strategic recommendations |
| **Learn from trends and experience** |
| Gather information on the eHealth environment |
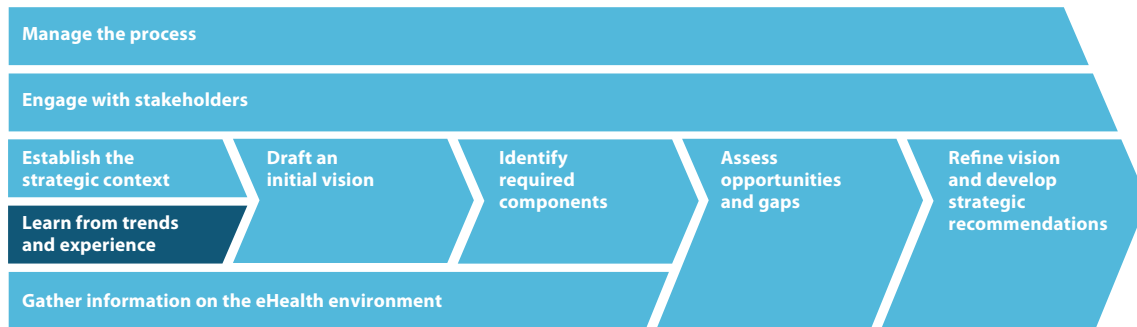
Objective

Research on the eHealth experience of other countries (including successes and failures), as well as trends and best practice can provide an understanding of the outcomes that can be achieved and the types of goals for which eHealth is relevant.

Activities

▸ Research national eHealth visions, strategies and programmes.

▸ Research international eHealth trends, best practice and outcomes.

Outputs

An understanding of:

▸ how eHealth is being used in similar countries and settings

▸ the types of health system goals or challenges that eHealth can address

▸ evidence of the specific benefits that eHealth has delivered in similar settings.

7.1 Research national eHealth visions, strategies and programmes

Objective

This step identifies knowledge and lessons from other national eHealth visions, strategies and programmes that may be used as input to the development of a national eHealth vision.

Examples of the type of information that this step should seek to identify include:

▶ health system goals and challenges that countries are trying to address through eHealth

▶ strategic recommendations on how eHealth should be used

▶ non-health sector goals and challenges where eHealth has been applied

▶ changes to information flows in health systems and services

▶ current and planned eHealth programmes, projects and pilots

▶ the current eHealth environment (and constraints) in which eHealth is implemented

▶ lessons learned from successes and failures.

This step should focus on countries that may be similar in terms of:

▶ health system structure and operation

▶ health system goals and challenges

▶ eHealth and national development context.

Recommended outputs

This step should produce a broad understanding of the national eHealth visions, strategies and implementation programmes of similar countries.

Approach

Internal research and analysis, complemented with exploratory interviews with representatives from other countries.

Internal research and analysis

This step requires selecting appropriate countries and deciding the questions to be asked. A small set of countries should be decided upon at an early stage in order to focus research efforts and ensure this step is appropriately time-limited. This can be a challenging undertaking, due to a lack of familiarity with other countries, a lack of comparability in many instances, and the time required to undertake this work.

Information should be sought from the relevant health departments and agencies. Some countries may have a dedicated eHealth department; or eHealth may be delegated to a non-health department or agency. The existence of these entities should be confirmed early in the process.

Reports from international agencies, such as WHO, may be of use when information is not directly available from countries. Relevant reports should be reviewed as input to this step.

Exploratory interviews

Relying on research alone for a full understanding of another country's eHealth programme, and the lessons associated with its implementation, can also be challenging. For countries of particular interest there may be value in organizing regional meetings, study tours or interviews with individuals who are responsible for eHealth. It is important to focus the enquiry on experience and lessons learned. Most countries are open to sharing knowledge about their eHealth experience. The primary challenge is often locating the right individual(s) with whom to communicate, particularly in those countries without a nationally-coordinated approach to eHealth.

7.2 Research international eHealth trends, best practice and outcomes

Objective

This step develops a broader understanding of how eHealth can be applied to health systems goals and challenges. Globally, there are numerous projects and research studies on the application of eHealth to particular health systems, settings and challenges. Understanding these and the benefits and outcomes they have delivered helps to inform a national eHealth vision.

Examples of the type of information that this step should seek to identify include:

▶ eHealth services and applications in use in other countries

▶ health system goals and challenges that eHealth services and applications address

▶ health system settings in which these services and applications are being used

▶ challenges and barriers experienced in delivering eHealth

▶ measured benefits or outcomes, such as clinical effectiveness outcomes (e.g. reductions in adverse medication reactions) and efficiency outcomes (e.g. reductions in the number of diagnostic tests requested).

Recommended outputs

This step should lead to an understanding of the common ways in which eHealth has been used in other countries to address specific health system goals and challenges, and the benefits and outcomes that it has delivered.

Approach

Research should focus on information on the use of eHealth to address health system goals and challenges. Most of this research can be conducted via the Internet. Common sources of information include government, agency and industry reports on the use of eHealth and studies found in clinical, technology and other journals and publications. Information from international agencies such as WHO can also be used as input to this step.

CHAPTER 8
Draft an initial vision

This stage focuses on drafting an initial 'unconstrained' eHealth vision.

| Manage the process |
| Engage with stakeholders |

| Establish the strategic context | **Draft an initial vision** | Identify required components | Assess opportunities and gaps | Refine vision and develop strategic recommendations |
| Learn from trends and experience |

| Gather information on the eHealth environment |
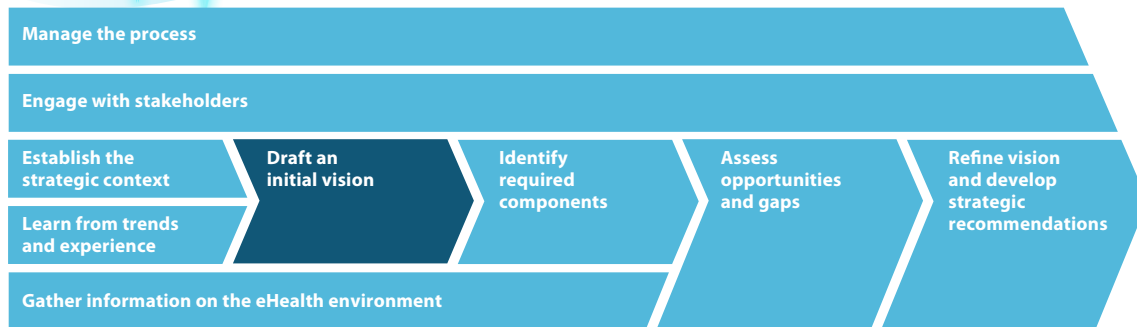
Objective

A national eHealth vision describes how eHealth will contribute to achieving a country's health goals. It will reflect stakeholder input obtained so far, and be informed by research on global eHealth trends and practices.

Activities

▶ Agree the time horizon for the eHealth vision.

▶ Define desired eHealth outcomes based on health goals and challenges.

▶ Describe the rationale for each outcome sought; link outcomes to the strategic context.

▶ Develop an initial vision statement.

▶ Describe what delivering the national eHealth vision will mean for stakeholders.

▶ Develop one or more scenarios that put the national eHealth vision into practice (optional).

Outputs

A description of:

▶ the health system outcomes that eHealth should enable or support
   (Note: outputs and outcomes are defined in Annex G)

▶ the rationale between outcomes and the strategic context for eHealth

▶ the benefits to stakeholders

▶ one or more scenarios that demonstrate the national eHealth vision in practice (optional).

8.1   Agree the time horizon

Objective

This step determines the time horizon for the eHealth vision. This improves focus and ensures that the benefits and outcomes can be described in terms of a target delivery date (e.g. "By 2020 eHealth will enable the country to…").

The time horizon takes into account:

- ▶ the national health strategy and its timeframe for targets and goals
- ▶ lessons from other national eHealth strategies, and associated timeframes
- ▶ guidance provided by senior political and health sector decision-makers.

Recommended outputs

This step defines the timeframe for the national eHealth vision, agreed to by health sector leadership.

Approach

Internal analysis followed by review and agreement of relevant stakeholders.

8.2   Define the desired eHealth outcomes

Objective

This step defines the change, or outcomes, that a national eHealth environment should produce. It answers questions on what will be achieved or changed by using eHealth, and how the health system and services will change as a result (Table 15).

eHealth outcomes are achieved by establishing a national eHealth environment that:

- ▶ improves information flows within the health sector
- ▶ improves electronic access to health services and information.

eHealth outcomes are derived from strategic themes (goals and challenges) and country context. Once agreed, the eHealth outcomes form the basis for determining the required components.

Table 15. Sample questions for defining eHealth outcomes

Sample question	Areas where changes may be needed
What changes to the health system and services are required to meet the goals identified in the strategic context? **Where are changes needed?**	• Health system and services planning, management and reporting • Models of care • Coordination and continuity of health-care delivery • Access to health-care resources and infrastructure • Supply and distribution of the health workforce • Quality and safety of health-care delivery • Time and cost of health-care delivery • Role of individuals in managing their own health and well-being • Policy, investment and research decision-making
What changes to health information flows, etc. would support these desired changes?	• Capture and sharing of health information between health-care providers • Capture and sharing of population health data • Monitoring and reporting on population health outcomes • Access to medical information and care delivery tools that support health-care providers in delivering care to individuals • Access to health education and awareness information for individuals and carers • Access to health services for individuals in remote or rural communities

Recommended outputs

This step should describe the eHealth outcomes, followed by:

▶ the required changes to health information flows or the way in which health services are delivered; and

▶ the health system outcomes that result.

This approach ensures each description can stand alone, but that its value to the health system is clear (Box 1).

Box 1. Examples of eHealth outcomes

- Enable electronic access to appropriate health-care services for citizens in remote, or rural communities.
- Facilitate continuous improvement of the health system through more effective utilization of health outcome information.
- Improve the quality, safety and efficiency of clinical practices by giving care providers better access to patient information, clinical evidence and decision support tools.
- Support more informed policy, investment and research decisions through access to timely, accurate and comprehensive reporting health-care system activities and outcomes.
- Ensure the right consumer health information is made available electronically to the right person at the right place and time to enable informed care and treatment decisions.
- Enable the health sector to operate more effectively as a connected system, overcoming fragmentation and duplication of service delivery.
- Provide consumers with electronic access to the information needed for better management and control of their own health.
- Enable multi-disciplinary teams to communicate and exchange information electronically and provide better-coordinated services across the continuum of care.

Approach

Internal working sessions to formulate a concise description of how eHealth will be used to respond to health system goals, encompassing insights from research into eHealth trends and best practice. Experience suggests that consultation with stakeholders on eHealth outcomes should be delayed until the vision statement has been drafted and the impact on stakeholder groups identified.

8.3 Link eHealth outcomes to the strategic context

Objective

This step describes the rationale between the strategic context and the eHealth outcomes defined in the previous step. A national eHealth vision should demonstrate how it addresses health system goals, and how it responds to stakeholders' needs. Without a clear link to the strategic context, a national eHealth vision risks being misinterpreted or considered irrelevant. In some cases, eHealth outcomes will address multiple health system goals, so outcomes should be described in a broad manner. Describing the rationale clearly makes the relationships explicit.

Recommended outputs

This step should produce a description of the rationale between eHealth outcomes and the health system goals defined as part of the strategic context for eHealth (Box 2).

Box 2. Sample links between eHealth outcomes and health system goals

Health system goal or challenge	
Health workforce shortages primarily affect rural and remote communities, due to the concentration of professionals in urban areas.	
eHealth outcome	**Rationale**
Enable electronic access to appropriate health-care services for patients in rural and remote communities.	Enabling individuals to access services through electronic means will partly compensate for health workforce shortages.
Health system goal or challenge	
To have halted by 2015 and begun to reverse the spread of HIV/AIDS in our country.	
eHealth outcome	**Rationale**
Provide individuals with electronic access to the information they need about preventing HIV/AIDS and other diseases.	Access to education and awareness information about HIV/AIDs and other sexually transmitted diseases is an effective way to combat the spread of these diseases.
eHealth outcome	**Rationale**
Facilitate improved monitoring and surveillance of population health through more effective data collection, reporting and exchange.	Surveillance and reporting on HIV/AIDS is essential to the planning and implementation of programmes aimed at halting and reversing the spread of the disease.

Additional information could be provided to strengthen the rationale for the associated eHealth outcome. Examples include outcomes of relevant eHealth projects and other studies, identified through research and stakeholder consultation.

Approach

Internal working sessions are held to develop a sound rationale for each outcome sought. The knowledge to support this step should exist largely through activities already undertaken. Country experience recommends that consultation with stakeholders on the rationale should be delayed until the national eHealth vision statement has been drafted, and impacts on stakeholders identified.

8.4   Develop an initial vision statement

Objective

This step develops an initial vision statement that can be endorsed by political and health sector decision-makers, used to support health policy, and easily communicated to stakeholders and constituencies. The statement should be meaningful and relevant, and should not be technology-oriented.

A vision statement is a high-level statement that communicates the value of eHealth in a simple and understandable manner. It describes how eHealth will lead to achieving the strategic benefits for the health system, and within what timeframe.

Recommended outputs

This step should produce a vision statement that has been reviewed and refined with the relevant stakeholders (Box 3).

Box 3. Sample structure for an initial vision statement

> **By** *[timeframe]*
> **eHealth will deliver** *[strategic benefits and outcomes for the health system and population]*
> **through** *[strategic changes to health information flows].*

This structure ensures that the vision statement for eHealth can exist in isolation and still communicate the value of investing in a national eHealth environment (Box 4).

Box 4. Sample country vision statement for eHealth

> **By 2020**
> **eHealth will enable** a safer, higher quality, more equitable and sustainable health system for all citizens
> **by transforming** the way information is used to plan, manage and deliver health services.

Visual models can be used to communicate complex vision statements (Figure 8).

Figure 8. Sample visual model for an eHealth vision statement

Health system priorities		
Benefits to health system	Benefit 1	Benefit 2	Benefit 3
eHealth outcomes	Outcome 1	Outcome 2	Outcome 3
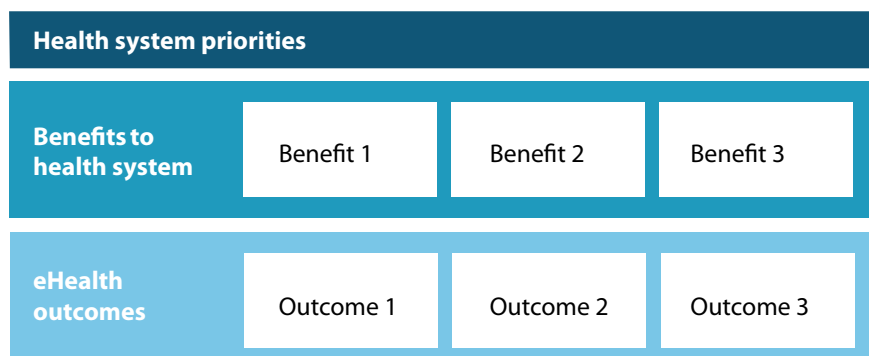
The model above communicates a vision for eHealth through three elements:

▶ the strategic health system priorities and focus for eHealth

▶ the expected benefits or outcomes to the health system

▶ the eHealth outcomes that are sought.

Approach

This step requires internal working sessions to draft a compelling vision statement for eHealth. Once developed, the statement should be reviewed with a small group of stakeholders. The focus should be on refining the content of the statement, the eHealth outcomes that underpin it, and the manner in which the vision has been articulated. Broader consultation on the vision statement should be deferred until the impact of the vision has been described for stakeholders.

8.5 Describe what the eHealth vision will mean for stakeholders

Objective

This step describes how eHealth will change stakeholders' experience with the health system. This helps stakeholders understand what eHealth means for them, and is critical to gaining their support for the vision (Table 16).

Table 16. Sample questions for describing the vision for important stakeholders

Example questions	Potential considerations
Which are the important stakeholder groups for which the vision should be described?	• Individuals • Health-care providers • Health-care managers and administrators • Medical researchers • Others, including sub–groups within the above stakeholder groups (e.g. rural and remote individuals, rural and remote health-care providers) Note that this should build on stakeholders' understanding that has been developed during the activities in Section 4.
What is each stakeholder group's current experience when interacting with the health system?	This should be driven by the health system challenges that were identified through the strategic context, which may include areas such as: • access to health information • access to care delivery tools • access to health-care services • coordination and continuity of health-care delivery • their role in the health system.
How will eHealth improve their experience with the health system?	This covers the same areas as above, except that the focus is on describing practically how the challenges will be overcome as a result of delivering the vision.

Recommended outputs

This step should describe the eHealth vision for important stakeholder groups, including:

▸ challenges they currently experience in relation to health services or the health system

▸ improvements they would experience if the vision were delivered (Box 5).

Box 5. Sample national eHealth vision for health-care providers

The 2020 eHealth vision for health-care providers
Delivering our national eHealth vision will enable health-care providers to make more informed decisions at the point of care as a result of better access to accurate and complete individual health information, the support of decision-support tools and access to an improved evidence base for treatment decisions. They will deliver care more efficiently and be able to share information and coordinate care delivery more easily with other providers.

What happens today?	What will the eHealth vision deliver by 2020?
• Working with incomplete information when providing patient care. • Wasting time collecting patient information and duplicating treatment activities. • Manually coordinating care with other providers and exchanging information in an inefficient, incomplete and ad hoc manner. • Risking the occurrence of adverse events through incomplete information and a lack of access to decision-support tools at the point of care. • Limited ability to interact with patients remotely. • Difficulty in monitoring adherence or response to treatment and medication. • Limited means to monitor effectiveness of service delivery outcomes.	• Health professionals will have an integrated and complete view of patient health information at the point of care. • Multi–disciplinary provider teams will be electronically connected to enable more coordinated care delivery. • Health professionals will be able to share information electronically in a timely and secure manner across different locations and all parts of the health sector. • Health professionals will have access to data that allows them to monitor and evaluate service delivery outcomes more effectively. • Health professionals will be able electronically to order tests, prescribe medications and refer individuals to other providers. • Care decisions will be supported by access to information sources and decision-support tools at the point of care. • Health professionals will be able to interact electronically with patients regardless of location. • Health professionals will be supported by automated patient monitoring.

Approach

This step is an internal activity that develops descriptions of what the eHealth vision will mean for important stakeholder groups, particularly in terms of benefits and improvements in their current experience with the health system. Once developed, the descriptions should be reviewed and refined with each group to ensure they are accurate and meaningful. This is where stakeholders start to understand what the vision means for them, so consultation may uncover opinions, perspectives and concerns that require revisiting the eHealth outcomes. In fact, this is often the point where refining the national eHealth vision begins.

8.6 Develop one or more scenarios that put the national eHealth vision into practice (optional)

Objective

This step develops scenarios that communicate how a national eHealth vision will look in practice. Scenarios typically describe hypothetical but common, real-world situations illustrating how challenges would be addressed by eHealth.

Scenario development is an optional step that provides additional detail for stakeholders. Country experience suggests that scenarios are valuable for educating and building awareness of the intended role of eHealth.

Developing scenarios requires an understanding of:

▶ the stakeholder groups that should feature in the scenario

▶ the current health system challenges that the scenario should focus on demonstrating

▶ the future role of eHealth in overcoming these challenges.

Recommended outputs

This step should produce one or more scenarios that will assist important stakeholder groups to understand how delivering the national eHealth vision will improve their experience with the health system (Box 6).

Box 6. Sample scenario

How eHealth would change Akeyo's experience

Akeyo and her family live in a rural area in east Africa where over 65 per cent of the 4.4 million people live below the poverty line. Akeyo has recently been diagnosed with Type 2 diabetes. This happened almost by chance, when she was visiting the nearest health centre with her daughter for a routine immunization. During the discussion with the doctor, Akeyo reporting feeling frequently tired herself. The doctor requested a blood test, which led to the diagnosis.

Akeyo's experience with the current health system

It takes Akeyo and her family, including six children over three hours to walk to the health centre, which has a visiting doctor from one of the sub-district hospitals. Akeyo has not met this doctor before and they are unlikely to meet again because the doctor will only be at the clinic for one day, and has over 100 patients to see and children to immunize.

While the doctor is administering the childhood immunization to her daughter, Akeyo mentions she is more tired than usual. The doctor orders a blood test which shows that Akeyo is experiencing the onset of Type 2 diabetes. Akeyo's doctor has only one minute to explain to her what Type 2 diabetes is and how to manage her symptoms. There is no paper-based information to give her, and thus she must rely on the doctor and community health worker present to give her the information she needs very quickly.

Walking back to her village from the clinic with her children, Akeyo is confused, and does not understand the implications of the diagnosis or how to manage her condition. She has no access to written or electronic information on diabetes (such as information available via the Internet).

Akeyo is very busy with her family and life goes on. Forgetting about her diagnosis, she does not change her diet or level of exercise or receive further support for her condition. Over time Akeyo notices that she is becoming even more tired and is experiencing tingling in the toes of her left foot and blurred vision. She is no longer able to walk the three hours to the health centre, and the complications from her Type 2 diabetes are becoming more serious. She is now at great risk of blindness, heart disease, nerve damage and loss of blood flow to her limbs, as well as kidney disease. This means she that will no longer be able to look after her children adequately and is at risk of premature death.

How eHealth would change Akeyo's experience with the health system

With growing mobile phone penetration in the country, Akeyo's experience could have been quite different. For example, her husband has a mobile phone which could have been used to deliver mobile eHealth (or mHealth) services. With the introduction of mHealth, the events that occurred in the above scenario would have been different in the following ways:

• **Pre–emptive care**
  - *Education* – diet and general health information regarding diabetes could have been delivered to Akeyo via her husband's mobile phone, telling her what she should and should not be eating in order to manage her blood sugar levels better.
  - *Helpline* – a helpline could enable Akeyo to get advice and consult about her diabetes with a health worker or doctor. Akeyo could receive dietary counselling to help manage her blood sugar levels, and information on when a medical adviser would be at the nearest health centre if she needed to make an appointment.
  - *Treatment support* – a mobile community health worker would visit Akeyo's village once a week and provide it with Bluetooth–based blood glucose metres. Akeyo could now regularly measure her blood glucose level and upload this to a diabetes management service via mobile phone. This would enable remote health-care providers to monitor her blood glucose levels and send her an SMS with health management information. She would also receive a weekly SMS with updated advice, and information, to help keep her focused and motivated.

• **Safer care** – with the implementation of Electronic Health Records (EHRs) or summary records Akeyo's medical practitioners would now be aware of her diagnosis and help her manage her chronic illness. They would know to check her glucose levels when they meet and to review her treatment options, prescribing medications if necessary.

• **More efficient use of a care provider's time** – having access to Akeyo's EHR means that the visiting mobile community-based health worker would no longer have to ask Akeyo for her health information each time they meet. This record would also be available to other medical professionals that Akeyo may interact with either in person or by phone.

In this scenario, Akeyo is now much more successful in managing her Type 2 diabetes and in avoiding the serious complications, because there is adequate monitoring of her condition and control of her blood sugar levels. This means that her quality of life and life expectancy will be dramatically improved, and she will be able to continue to work, and care for her family.

Approach

Developing scenarios is a creative exercise that involves constructing a story to demonstrate how eHealth will improve the health system experience for stakeholders. Examples of eHealth services and applications (such as those described in Annex A) can be used to add further credibility and realism to the scenario. Once developed, scenarios should be reviewed and refined with the relevant stakeholder groups. This provides an opportunity to gather input and insights to ensure the scenario is accurate, and builds awareness and support for the national eHealth vision.

CHAPTER 9
Identify the required eHealth components

This stage focuses on identifying the eHealth components required to deliver the eHealth vision, which is still at a draft stage.
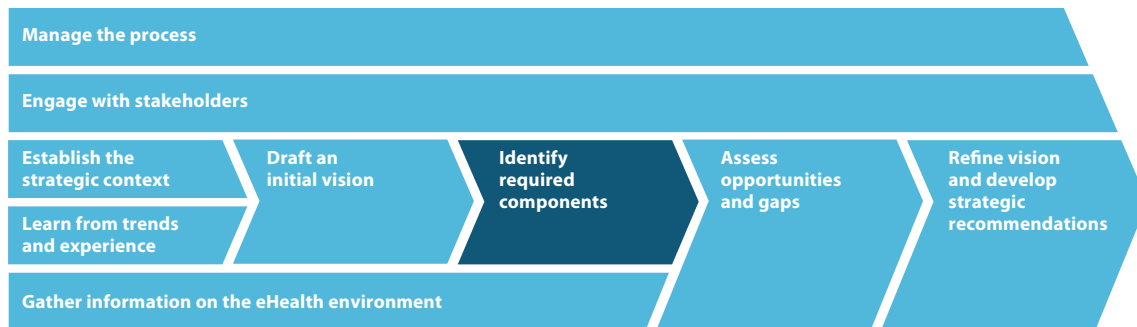
Objective

Once the initial 'unconstrained' vision for the national eHealth environment has been drafted, it is possible to define the required eHealth components, or building blocks, of a national eHealth environment.

Activities

Identify the required eHealth components across the seven component areas:

- ► leadership and governance
- ► strategy and investment
- ► services and applications
- ► infrastructure
- ► standards and interoperability
- ► legislation, policy and compliance
- ► workforce.

An eHealth strategic architecture model may also be created at this stage, to communicate the required eHealth components in a visual manner (optional).

Outputs

A description of:

- ► the set of eHealth components needed to deliver the national eHealth vision
- ► the relationships and interdependencies between the components.

9.1   Leadership and governance

Objective

This step identifies the eHealth leadership and governance components required to direct and coordinate national, state, regional and local eHealth activities towards the delivery of a national eHealth environment (Table 17).

Table 17. Examples of common eHealth leadership and governance components

Component	Description	Examples
Programme management	Oversight and coordination of specific eHealth initiatives across the national eHealth programme to ensure delivery of on-time and on-budget projects.	• Project coordination • Progress tracking and reporting • Risk management • Dependency management
Stakeholder engagement	Consultation with stakeholders to gather input and ensure they are involved for the duration of the programme.	• Reference groups • Engagement forums • Public consultation • Communications strategy and plans
Strategic architecture	Defines the eHealth and enabling functions required to ensure that eHealth can operate successfully and deliver the expected benefits.	• Requirements definition • Component models • Functional architecture • Reference architecture
Clinical safety	Oversight and management of clinical safety risks and concerns regarding the development of a national eHealth environment, ensuring that the system which is delivered is trusted and supported by health-care professionals.	• Hazard identification and assessment • Development of safety and mitigation controls and procedures • Development of clinical safety policy • Oversight of clinical safety education and training activities
Management and operation	Management, operation and support of the national eHealth environment to ensure it is reliable and available to support individuals, health-care providers, administrators and managers.	• Availability, incident, access and service-level management • Change management
Monitoring and evaluation	Enables measurement of the outcomes that are being delivered, the identification and correction of planned outcomes that are not being achieved, and demonstrates to stakeholders the outcomes that have been achieved.	• Outcome identification, monitoring and assessment
Policy oversight	Oversight of adherence to eHealth, health and broader policies that support the development of the national eHealth environment.	• Policy identification and assessment • Policy linkages

These components may exist at different levels including at national, state, regional and local (e.g. hospital, health-care provider organization) levels. Roles, relationships and responsibilities will need to be defined during implementation planning.

Recommended outputs

This step should produce a description of the leadership and governance required for the national eHealth environment. This should include a description and chart, or visual model, of the recommended functions and mechanisms required at national, state, regional and local levels including:

▶ leadership and governance bodies and mechanisms

▶ roles and responsibilities

▶ relationships between these governance bodies and mechanisms.

Approach

This step should be approached as an internal activity that involves brainstorming and working sessions to identify the preferred leadership and governance model, including defining the relationship to existing bodies at national, state and local levels.

9.2   Strategy and investment

Objective

This step identifies the eHealth strategy and investment components required to develop, operate and sustain the national eHealth environment. These components support the development of strategy and plans at various levels to guide the development of that environment. eHealth investment components focus on providing the appropriate investment and funding for the execution of eHealth strategies and plans (Table 18).

Table 18. Examples of common eHealth strategy and investment components

Component	Description	Examples
Strategy and planning	Establishes the eHealth strategy and plan to guide the development of the national eHealth environment in response to health system goals and challenges.	• National, state, regional and local eHealth strategy and planning bodies and mechanisms • Integration of these bodies between different levels
Funding	Enables the development and operation of the national eHealth environment.	• National, state, regional and local eHealth and health ICT funding mechanisms and incentive schemes
Investment management	Supports the allocation of eHealth investment funding to projects that assist the development of a national eHealth environment.	• eHealth investment and business case development • Evaluation and prioritization of eHealth investment and business cases • Budgeting and tracking of investment funds

Recommended outputs

This step should produce a description of the eHealth strategy and investment components required to support the development and operation of the national eHealth environment.

Approach

Internal activity that involves brainstorming and working sessions to identify the required eHealth strategy and investment components needed to develop, operate and support the national eHealth environment.

Where possible, these components should be linked back to the eHealth outcomes defined in Section 8.2, as a means of creating traceability to the strategic context for eHealth. Given the enabling nature of these components, they may also be linked to service and application, infrastructure or standards components.

Internal activity that involves brainstorming and working sessions to identify the required eHealth strategy and investment components needed to develop, operate and support the national eHealth environment.

9.3   Services and applications

Objective

This step identifies the eHealth service and application components required to address the health system goals. Services and applications are the means to address the needs of individuals, health-care providers, managers and administrators. These components enable stakeholders to access, use and share health information, and deliver health services in new ways.

Understanding how health information flows need to be improved, or how health services need to be delivered via electronic channels, will assist in identifying the eHealth service and application components that need to be present in the national eHealth environment (Table 19). This understanding should have been developed during the stage of establishing the strategic context and the initial eHealth vision.

Table 19. Examples of common eHealth service and application components

Component	Description	Examples
Individual electronic health information	Services that support the collection and storage of health information for an individual.	• Electronic health records (EHR) • Electronic medical records (EMR) • Personal health records (PHR)
Health-care communications and collaboration	Services that enable health-care providers electronically to communicate and share information with other such providers as part of providing care to an individual.	• Electronic referrals and specialist letters • Electronic health event summaries, prescribing and test ordering • Access to an individual's EHR and test results • Health-care provider and service directories • Care plan management • Appointment booking and management
Health-care service delivery tools	Services that support health-care providers in making diagnosis and treatment decisions, and in managing the delivery of care to an individual, whether electronically or in person.	• Medications management • Prescription and test ordering decision support • Clinical decision support • Alerts monitoring and management • Chronic disease management • Real-time clinical data access and analysis • Telemedicine (telehealth) and mobile health (mHealth)
Health information and knowledge	Services that enable individuals and health-care providers to access trusted and verified health information and knowledge.	• Consumer health knowledge sources • Health-care provider knowledge sources • Distance learning and electronic resources
Health-care management and administration	Services that enable health-care managers and administrators to manage effectively the delivery of care to individuals and monitor the health of the broader population.	• Adverse event monitoring • Risk analysis • Compliance monitoring • Surveillance and At-Risk Identification • Health-care operations management • Clinical practice improvement • Health programme design and optimization • Health policy development • Health care and clinical research

Recommended outputs

This step should produce a description of the eHealth service and application components required to deliver the eHealth outcomes described by the initial eHealth vision.

Approach

This step should be approached as an internal activity that involves brainstorming and working sessions to identify the required eHealth service and application components, and link these back to the eHealth outcomes defined within the initial vision for national eHealth. This helps stakeholders understand why the identified eHealth service and application components are required in the national eHealth environment (Box 7).

Box 7. Linking an eHealth service and application component to an eHealth outcome

Health system goal or challenge	
Health workforce shortages primarily affect rural and remote areas and communities due to the concentration of many highly trained professionals in urban and metropolitan areas.	
eHealth outcome	**Rationale**
Enable electronic access to appropriate health services for citizens in rural and remote communities.	Enabling individuals to access health services remotely through electronic means will partly address challenges of health workforce shortages.
Service and application components	**Rationale**
Service delivery channels (Telehealth)	Telehealth services for electronic consultations support delivery of quality care to individuals living in areas affected by workforce shortages.

These components should not be defined in detail, as this may require a significant amount of time for little additional benefit. It may also unnecessarily constrain the way in which these components can be realized physically. The implementation plan will determine the detailed requirements and design of these components.

Other components will probably be identified during this step. Often, these are enabling components, such as infrastructure, policy and standards. They should be noted as they are identified, and considered when analysing that specific component.

9.4   Infrastructure

Objective

This step identifies the eHealth infrastructure components required to support the sharing of structured and meaningful health information across geographical and health-sector boundaries, and to support new and improved ways of delivering health-care services and information.

Strong international evidence shows that countries only make significant progress at a national level once they have established eHealth infrastructure components to support health information exchange. It is significantly more cost-effective to develop core eHealth infrastructure components at a national level, rather than duplicating effort and expenditure across a fragmented set of eHealth programmes.

Infrastructure components span both physical technology infrastructure and software platforms and services that support health information exchange across the health sector (Table 20).

Table 20. Examples of common eHealth infrastructure components

Component	Description	Examples
High-speed data connectivity	The high-level data networking and connectivity infrastructure required to support priority eHealth services and applications, and the broader national eHealth vision.	• Metropolitan, regional, rural and remote network coverage • Mobile coverage
Computing infrastructure	The physical computing infrastructure (e.g. PCs, laptops, PDAs, mobile phones, server infrastructure, etc.) that hosts software applications which enable the collection, recording and exchange of electronic information across the health sector, and support health-care service delivery.	• National, state, regional and local computing infrastructure • Health-care provider computing infrastructure
Identification and authentication services	The core services that enable the secure transmission and delivery of messages and the appropriate authentication of the message receiver, to ensure that information is transmitted in a secure manner, and is delivered to the correct recipient.	• Unique identifiers for health-care organizations, providers and individuals • Health-care provider authentication • Secure messaging
Directory services	Services that enable the identification of health-care providers by name or identifier, or by the type of health-care services that they provide.	• Health-care provider directories • Health-care service directories
Health-care provider systems	The information systems (applications) used by health-care organizations and providers to capture, collect and view health information for individuals.	• Practice management systems • Patient management systems • Clinical information systems
Individual Electronic Health Record (EHR) repositories	Repositories and associated services that support the secure storage of and access to an individual's electronic health record (EHR) across geographical and health sector boundaries.	• Approach to implementing repositories at various levels including national, state, regional and private organizations.
Health information datasets	Datasets that support health-care management and administration, which typically provide access to longitudinal and aggregated information for analysis, reporting, research and decision-making.	• Information requirements for priority health system management and administration • Information requirements for health and medical research activities

Recommended outputs

This step should produce a description of the eHealth infrastructure components required to support the eHealth service and application components identified in Section 9.3, and the broader changes to health information flows required to deliver the eHealth outcomes described in the initial.

Approach

This step should be approached as an internal activity that involves brainstorming and working sessions to identify the required eHealth service and application components, and linking these back to the eHealth outcomes defined in the initial eHealth vision. This helps stakeholders understand why these components are required in the national eHealth environment (Box 8).

Box 8. Linking an infrastructure component to an eHealth outcome

Health system goal or challenge	
Health workforce shortages affect rural and remote communities due to the concentration of professionals in urban areas.	
eHealth outcome	**Rationale**
Enable electronic access to appropriate health services for citizens in rural and remote communities.	Enabling individuals to access health-care services remotely through electronic means will partly address challenges of health workforce shortages.
Infrastructure component	**Description**
High-speed data connectivity	Delivering health services to rural and remote communities will require high-speed data connectivity, technically able to support telemedicine applications, for communities and urban health facilities.
Infrastructure component	**Description**
Computing infrastructure	The delivery of telemedicine applications will require that urban facilities and rural and remote communities have access to the appropriate computing infrastructure, networked with a high-speed data connection and with appropriate software and peripherals (such as video camera).

As above, these components should not be defined in detail, as this may require a significant amount of time for little additional benefit. It may also unnecessarily constrain the way in which these components can be realized physically. The implementation plan will determine the detailed requirements and design of these components. Other eHealth components will likely be identified during this step, usually enabling components such as policy, standards and information protection for example. They should be noted as they are identified, and considered when analysing that specific component.

9.5   Standards and interoperability

Objective

The step identifies the eHealth standards and interoperability components required to enable the consistent and accurate collection and exchange of health information across geographical and health-sector boundaries (Table 21). Without these components, health information cannot be collected consistently, will be open to misinterpretation, and will be difficult or impossible to share due to incompatibilities in data structures and terminologies.

Table 21. Examples of common eHealth standards and interoperability components

Component	Description	Examples
Data structure standards	These standards govern the way health datasets are stored using consistent data structures and can be presented with consistency in software applications, to ensure information is neither misinterpreted nor overlooked.	• Referrals and specialist letters • Health event summaries • Prescriptions, test orders and results • Care plans • Real-time clinical data • Appointments • Electronic health records
Common terminologies	These enable information communicated electronically to make use of a common language for describing symptoms, diagnoses and treatments.	• Clinical coding standards • Medical terminology standards • Medicines terminology standards

Component	Description	Examples
Messaging standards	These define message structure to allow data to be transmitted and received through the secure messaging infrastructure from one care provider to another. They also define the acknowledgements that should be provided when a message is delivered or opened and the warnings to be generated if the message is not delivered, or is declined.	• Message structures • Message transmission protocols • Message acknowledgement protocols
Secure messaging standards	These are for the secure transmission and delivery of messages and the appropriate authentication of the message receiver, to ensure that information is securely transmitted and delivered to the correct recipient.	• Privacy and confidentiality • Authentication • Non-repudiation
Software accreditation standards	These define the criteria with which eHealth software products and services must comply in order to be certified as able to exchange health information with the national eHealth environment.	• Quality • Security • Interoperability

Recommended outputs

This step should produce a description of the eHealth standards and interoperability components required to support:

▶ the eHealth service and application components identified in Section 9.3

▶ the eHealth infrastructure components identified in Section 9.4

▶ broader changes to health information flows required to deliver the eHealth outcomes described in the initial eHealth vision.

Approach

This step should be approached as an internal activity that involves brainstorming and working sessions to identify the required eHealth standards and interoperability components, and link these back to the eHealth outcomes. The link can also be made by describing how eHealth standards and interoperability components are required to support a service and application or infrastructure component, which in turn has been linked to an eHealth outcome (Box 9).

Box 9. Linking eHealth standards and interoperability to eHealth outcome

Health system goal or challenge	
To have halted by 2015 and begun to reverse the spread of HIV/AIDS in our country.	
eHealth outcome Facilitate improved monitoring and surveillance of population health through more effective data collection, reporting and exchange	**Rationale** Improved monitoring and surveillance of health outcomes related to HIV/AIDS is essential to the planning, management and implementation of health programmes.
Service and application components Health care management and administration (Surveillance and At Risk Identification)	Surveillance of population health, in particular HIV/AIDS, is a critical aspect for the development of targeted prevention and care programmes. This requires the ability to collect, analyse and report on diseases and conditions across the population and special groups.
Service and application components Individual Electronic Health Information (EHR)	Requires the ability to capture, store and access health information for an individual regardless of the health-care provider(s) that the individual has visited. An EHR component will ensure that key health information, such as medical conditions, health event summaries, and test results, can be stored and used to support surveillance activities.

Standards and interoperability components Data structure standards	Effective monitoring and reporting outcomes requires that there is a common structure for storage of health and clinical event information, such as EHRs, health event summaries, and test orders and results.
Standards and interoperability components Common terminologies	Effective interpretation of health and clinical event data structures requires a common language for describing symptoms, diagnoses and treatments, particularly those associated with the diagnosis and treatment of HIV/AIDS.

Other eHealth components will probably be identified during this step, usually enabling components such as policy, standards, and information protection. They should be noted as they are identified, and considered when analysing that specific component.

9.6   Legislation, policy and compliance

Objective

This step identifies the eHealth legislation, policy and compliance components that are required to support the development and operation of the national eHealth environment (Table 22).

Table 22. Examples of common eHealth legislation, policy and compliance components

Component	Description	Examples
Legislation	National legislation, policy and regulatory components that govern how health information is stored, accessed and shared across geographical and health-sector boundaries.	• Unique health identifier regimes • Privacy, protection, storage and retention of personal health information • Consumer protection including in the online environment • Access and consent to personal health information use and disclosure, including secondary use • Audit and complaint procedures (e.g. such as those required for suspected breaches of privacy) • Licensing regimes which may be needed to ensure that private operators of components of a national eHealth environment meet required standards for privacy, integrity and security
Policy	Broader public policy required to support the development of a national eHealth environment.	• Health sector policy (e.g. reform, improved access to and use of health information) • Non-health sector policy (e.g. broader industry and economic development, utilization of existing eGovernment infrastructure) • Policies to stimulate and manage innovation, risk, evaluation of feasibility and utility of services
eHealth-specific policy	Policies specifically governing eHealth services, including privacy of health-related data held in digitized format, its use and sharing for research and the public interest.	• Policies on medical jurisdiction, liability for eHealth services (e.g. telemedicine), safety, data integrity and quality of care • Policies for reimbursement for eHealth services (e.g. telemedicine), both public and private • Policies for managing Internet health information quality, sales of medicines and regulated health products • Policies to demonstrate eHealth outcomes and clinical effectiveness
Compliance	Components required to support the development of eHealth products and which are compatible with the national eHealth environment.	• Development of national eHealth standards and other interoperability requirements • Compliance, conformance and accreditation of eHealth products and services

Recommended outputs

This step should produce a description of the eHealth legislation, policy and compliance components required to develop and operate the national eHealth environment.

Approach

This step should be approached as an internal activity that involves brainstorming and working sessions to identify the eHealth legislative, policy and compliance components required to deliver and operate the national eHealth environment; consultation with subject matter experts may be required.

Where possible these components should be linked back to eHealth outcomes. This link may also be achieved via eHealth service and application, infrastructure or standards components.

9.7   Workforce

Objective

This step identifies the eHealth workforce components required to design, develop, operate and support the national eHealth environment (Table 23). These components encompass workers who will use eHealth as part of performing their jobs (such as health-care providers) and those who will design, implement and support the broader national eHealth environment (such as health IT workers and health informaticians).

Table 23. Examples of common eHealth workforce components

Component	Description	Examples
Health workforce	The components required to deliver a health workforce that has the skills, experience and knowledge to apply eHealth in the management and delivery of care to individuals.	• eHealth skills and competencies that health workers require • Education and training (development, integration or changes to existing curricula) required to develop an eHealth-ready health workforce • eHealth accreditation requirements for health workers • Priority segments of the nation's health workforce • Implications for workforce change and adoption
Health ICT workforce	The same components as above but applied to designing, building, operating and supporting eHealth services.	• As above, but applicable to ICT workers

Recommended outputs

This step should produce a description of the eHealth workforce components required to develop, operate and support the national eHealth environment.

Approach

This step should be approached as an internal activity that involves brainstorming and working sessions. Where possible these components should be linked back to eHealth outcomes, including through eHealth service and application, infrastructure or standards components.

9.8 Develop eHealth strategic architecture models (optional)

Objective

This step develops architecture models that describe the eHealth components required to deliver the initial eHealth vision. These should not be technical models, because they are focused on conveying information to senior-level stakeholders.

A range of models could be developed. One example worthy of consideration is an *eHealth component map*, which logically structures, on a single page, the eHealth components required to deliver the national eHealth vision. This map can communicate complex information to various audiences in a way they can grasp quickly. Another possibility is a high-level stakeholder perspectives model, which describes what the national eHealth environment would enable different stakeholders (e.g. consumers, health-care providers, etc.) to do.

Recommended outputs

This step should produce a model that describes the eHealth components required to deliver the national eHealth vision (Figures 9 and 10).

Figure 9. Sample national eHealth component map[6]

eHealth Governance

| Strategy | Investment | Governance |

eHealth Solutions

Individual Electronic Health Record

Patient Demographics	Personal Health Diary
Allergies	Test Results
Current Health Profile	Event Summaries
Current Medication List	Access Control

Health Service Delivery

Referrals Sending and Receipt	Medications Prescription	Test Ordering
Event Summaries Sending and Receipt	Decision Support for Medications Prescribing	Decision Support for Test Ordering
Notifications Sending and Receipt	Prescriptions Sending and Receipt	Test Results Receipt and Analysis
Care Plan Management	Medications Management	Chronic Disease Management
Appointment Booking and Management	Clinical Decision Support	IEHR Access and Update
Alerts Monitoring and Management	Electronic Consultations	Real-Time Clinical Data Access and Analysis
Practice Performance Analysis		

Health Information

Consumer Health Knowledge Portal

Care Provider Health Knowledge Portal

Health Care Management

Adverse Event Monitoring	Clinical Practice Improvement
Risk Analysis	Clinical Decision Support Research and Improvement
Compliance Monitoring	Health Program Design and Optimisation
Surveillance and At Risk Identification	Health Policy Development
Health Care Operations Management	Health Care Research

eHealth Infrastructure

| Computer Systems | Broadband Connectivity | Practice, Patient and Clinical Management Systems |
| Universal Health Identifier Service (UHI) | National Authentication Service (NASH) | Provider and Services Directories | National Product Catalogue |

| Prescription Transfer Service | Individual Electronic Health Record (IEHR) Repositories | Health Information Datasets |

eHealth Enablers

Privacy

Privacy Regulations

Consent Management Policy

Standards

Data Structure Standards — Referrals, Event Summaries, Notifications, Prescriptions, Orders and Test Results, Care Plans, Appointments, Real-time Clinical Data

| Clinical Coding Standards | Data Presentation Standards | Security Standards |
| Medical Terminology Standards | Messaging Standards | Software Accreditation Standards |

Compliance

Compliance Services

IEHR Licensing Regime

Adoption

Awareness Campaigns	Professional Accreditation Standards
Incentives	Professional Practice Standards
Engagement Forums	Accreditation Regime
Clinical Practice and Process Redesign	Procurement Standards

Workforce

Care Provider Workforce Development

Health IT Workforce Development

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6   *National E-Health and Information Principal Committee. National E-Health Strategy, 30th September 2008. Adelaide, Deloitte Touche Tohmatsu, 2008.*

Figure 10. Stakeholder perspective model for a consumer stakeholder group[7]

Access Health Information
- Access health and well-being information on the internet
- Access health and condition-based communities
- Access personal health portal
- Access "HealthBook"
- Access service provider and services details

Consumer demand and new internet technology has enabled consumer access to health communities and information specific to their needs

Manage Health and Well-being
- Manage and monitor medication
- Monitor health and well-being
- Update medication details
- Remote access to clinician support
- Create, view and monitor appointments
- Support care of family community

Trend towards proactive management of the consumer or their families' health and well-being

Participate in Care Delivery
- Interact with care providers
- Interact with remote monitoring devices
- Record symptoms
- Review care plans

Electronic connectivity will provide consumers with new and more appropriate interaction channels with care providers or multidisciplinary teams

Consumers can more proactively participate in the care management of their "family community"

Pharmacy & Diagnostic Service
- Receive automated medication dispensing
- View test orders and results
- Make appointments online

Access Health Record
- Access personal health record
- Access medication record
- Access electronic care plan
- Maintain personal health record
- Manage access to health record

Consumers require greater access to their personal health information and a greater ability to control with whom it is shared

Family

Consumer

Community

Approach

Annex E provides the basis for developing an eHealth component map for a national eHealth vision, which can be extended or refined as needed, and accompanied with descriptions that define the intent or scope of each component.

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7   *National E-Health and Information Principal Committee. National E-Health Strategy, 30th September 2008.* Adelaide, Deloitte Touche Tohmatsu, 2008.

CHAPTER 10
Gather information on the eHealth environment

This stage focuses on gathering information about the country's current eHealth environment.
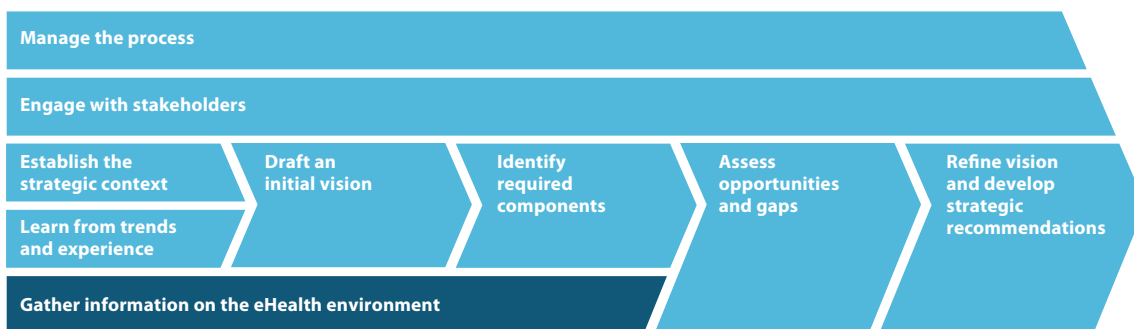
Objective

This stage focuses on understanding the current national eHealth environment in terms of eHealth components that already exist, or will be delivered within the timeframe of the eHealth strategy.

Activities

Investigate the current eHealth environment across the seven common component areas:

- ▶ leadership and governance
- ▶ strategy and investment
- ▶ services and applications
- ▶ infrastructure
- ▶ standards and interoperability
- ▶ legislation, policy and compliance
- ▶ workforce.

Outputs

A description of the existing or planned eHealth components that can be used to identify opportunities for re-use and sharing, as well as any gaps that will have to be addressed in the eHealth action plan.

10.1 Investigate the current eHealth environment

Objective

This stage identifies existing or planned eHealth components. This assessment will be used to identify opportunities to re-use or share components, and identify gaps to be addressed to deliver the eHealth vision. Sample questions are provided under each heading to assist with this step.

Leadership and governance

▶ Which organizations and bodies coordinate and develop eHealth at national, state, regional and local levels? What are their roles and responsibilities?

▶ Which organizations or groups are dedicated to the development of eHealth[8], and what is their current role in the development of a national eHealth environment?

▶ What competencies and capacities do the above groups have in order to deliver a national eHealth vision and associated work programme? For example, the question is whether they are competent and capable to perform:

- programme execution and oversight

- stakeholder engagement and consultation

- architecture design

- clinical safety governance and oversight

- management and operations

- monitoring and evaluation.

▶ Do these organizations currently collaborate, and if not, for what reasons?

▶ What authority and mandate do these entities have to direct action at the various levels of the health system (i.e. national, state and regional) to drive the development of a national eHealth environment?

▶ What level of autonomy do health-care organizations and providers currently have regarding investment in eHealth, and how does this differ across the health system?

▶ What level of fragmentation exists across the health system? For example, does the health system collectively focus on health system priorities, or do different segments and organizations focus on their own particular outcomes?

▶ What is the expressed political commitment to support the development of a national eHealth environment?

Strategy and investment

▶ Which organizations, bodies and other mechanisms are responsible for health strategy and planning at national, state, regional and local levels?

▶ How well integrated is health strategy and planning between the national, state, regional and local levels?

▶ How is the country's health system funded?

▶ How is investment in eHealth and the broader health ICT environment funded?

▶ Are there any government programmes or schemes through which funding is available for investing in health ICT or eHealth services and applications, and eHealth infrastructure?

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8   Examples include Canada Health Infoway and Australia's National eHealth Transition Authority (NEHTA).

▶ Are there any existing funding mechanisms for eHealth investments? Are these linked to priority health information flows or the implementation of eHealth standards?

▶ Which government organizations or bodies perform investment management roles for the development of national infrastructure?

▶ Have there been any eHealth strategies or plans that have failed or stalled? If so, what were the reasons?

Services and applications

▶ Which eHealth services and applications have been or are being implemented across the health sector, and what is the reason for their introduction?

▶ Which projects or pilots are underway to deliver eHealth services and applications, and what health challenges are these attempting to address?

▶ Which health information flows currently exist or are being implemented within the health sector?

▶ Which individual electronic health information services and applications are currently in use?

▶ What level of diversity exists among the health ICT applications and products[9] that are used today within the health sector? For example, are there applications or products that have a strong presence across the sector, or is there a proliferation of different applications or products in use to address local needs?

▶ Can existing eHealth services and applications be integrated with other services and applications, or scaled up beyond their current use to support larger individual and health-care provider populations?

▶ Which electronic communication channels are being used to deliver health-care services to individuals remotely, such as telephone, videoconference, web conference, mobile phone and other electronic consultation tools?

▶ What national health or other information and knowledge sources exist today?

▶ What level of adoption of eHealth standards has occurred among existing eHealth services and applications?

▶ How is investment in eHealth services and applications being funded (e.g. publicly, privately, other)?

▶ Which eHealth services, applications and information sources are used today to undertake health management, administration, analysis and reporting at a national, state and regional level?

▶ What are the challenges or barriers to the introduction and use of eHealth services and applications within the nation's health system?

▶ Have there been any large-scale eHealth services or application projects that have failed or stalled? If so, what were the primary reasons?

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9   Primarily those vendors that provide products and solutions that assist in the management and delivery of care to individuals, such as systems for practice management, patient management, clinical information and electronic medical records.

Infrastructure

▶ Can individuals, health-care providers and health-care organizations be uniquely identified across the health sector?

▶ How advanced are health-care providers and organizations in their adoption of ICT, in particular the use of computer systems and network-based communications?

▶ How advanced are they in their adoption of health-care provider systems, such as practice and patient management systems, and clinical information systems?

▶ Are there segments of the health sector that would be considered highly computerized, which may make them candidates for delivering 'quick wins'?

▶ Are there any existing repositories of electronic health information for individuals, such as electronic health records or any other data assets that capture information regarding an individual's encounters with the health system?

▶ What is the capacity and coverage of data connectivity and networking across the country, including metropolitan, regional, rural and remote areas?

▶ What is the capacity and coverage of mobile connectivity and networking (e.g. mobile phone coverage) across the country, including metropolitan, regional, rural and remote geographical areas?

▶ What is the penetration of computers and high-speed Internet in the general public?

▶ What is the penetration of mobile phones and other smart devices in the general public?

▶ What national, state and regional computing infrastructure exists across the country, including components such as server farms, data centres, support systems and personnel, etc.?

▶ Can existing infrastructure components scale up to support broader national use?

▶ Have there been large-scale eHealth or other ICT infrastructure projects that have failed or stalled? If so, what were the primary reasons?

Standards and interoperability

▶ What work has been done on establishing standards for the following:

- the storage of health datasets using consistent data structures

- the exchange of structured health data

- the unique identification of individuals, health-care providers and health-care organizations across the health sector

- the authentication of health-care organizations and providers

- the secure transmission of health information between health-care providers?

▶ What work has been done on establishing common medical and clinical terminologies?

▶ Are there any commonly agreed interoperability requirements or standards for eHealth and other health ICT services and applications?

▶ Are there any accreditation standards for eHealth services and applications which focus on ensuring interoperability with other services and applications?

▶ Which organizations or bodies are currently developing eHealth standards and other material to support interoperability across the health sector, and what is the scope of their work?

▶ Have there been eHealth standards or interoperability initiatives that have failed or stalled? If so, what were the primary reasons?

Legislation, policy and compliance

▶ What data protection legislation and regulatory frameworks[10] exist?

▶ Which areas do existing data protection legislation and regulatory frameworks address, such as:

  • individuals' choice to opt in or opt out of the collection of their personal health information;

  • purposes for collection, use, disclosure, accuracy, retention, access to and correction of erroneous information, security of an individual's personal health information;

  • regulatory, compliance and enforcement mechanisms?

▶ Do existing legislation and regulatory frameworks support or constrain the sharing of health information across geographical and health sector boundaries?

▶ If various data protection legislation and regulatory frameworks exist at different levels (e.g. national, state, regional), are they consistent with one another?

▶ Who is responsible for regulating compliance with data protection legislation, in particular across the nation's health sector?

▶ What risks do existing data protection legislation and regulatory frameworks pose to the growth and development of the national eHealth environment?

▶ What existing health policies and broader economic and national policies directly or indirectly support improved health information flows through the nation's health system? Conversely, are there policies that would act as a barrier or risk to investment in improving health information flows?

▶ Which organizations or bodies are currently responsible for the development of health sector and broader national standards?

▶ Which organizations or bodies are currently responsible for undertaking conformance, compliance and accreditation of products and services, including ICT, used in the health sector?

▶ Have there been any failed or stalled attempts to develop eHealth policy and legislation, or eHealth compliance processes? If so, what were the reasons?

▶ Are there policies to define medical jurisdiction, liability or reimbursement of eHealth services (public and private insurance), such as telemedicine?

▶ What policies address patient safety and quality of care through requirements for data quality, transmission standards, or clinical competency criteria?

▶ Are there policies for quality criteria, information management and sales of medicines and regulated health products on the Internet?

▶ Are there policies for equity of access to information, including for gender and other sociocultural groups?

▶ What policies exist to stimulate and manage innovations such as who is responsible for introducing change and innovation, how risks are managed and how to evaluate appropriateness, feasibility and utility?

▶ What policies exist to demonstrate health outcomes due to eHealth, and provide evidence on clinical effectiveness?

▶ What policies exist to promote e-commerce and services provision (for example, e-signature) in all sectors?

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10 May encompass aspects such as privacy, access, consent, use and disclosure of personal health information, as well as mechanisms by which complaints and breaches are identified and investigated.

Workforce

► What is the current level of skill of the health workforce in the use of eHealth and health ICT to support the day-to-day delivery of care to individuals?

► Are there any accreditation requirements regarding the use of eHealth and health ICT as a health-care provider?

► What education in the use of eHealth and health ICT to support delivery of care to individuals is currently provided by training programmes, such as those offered by universities, vocational training institutions and professional bodies?

► What level of consistency or commonality exists among different training programmes in the use of eHealth and health ICT to support the delivery of care to individuals? For example, is there a common definition of eHealth and understanding of the knowledge and skills that providers will require, or does this differ among training programmes?

► Which organizations or bodies are responsible for the development of education and training curricula for universities, vocational training institutions and professional bodies, in particular for health-care providers?

► What is the current state of the ICT workforce, and in particular the health ICT, eHealth and health informatics workforce?

► What training programmes exist to provide education in the design, implementation and operation of health ICT, eHealth and health informatics services?

► Are there recognized qualifications in the domains of health ICT, eHealth and health informatics?

► What is the market and availability of professionals in eHealth and informatics (e.g. domestic workforce, international workforce, other)?

Recommended outputs

This step should produce a description of the country's current eHealth environment across the seven common eHealth component areas.

Approach

This step will require a combination of internal research and analysis, and consultation with health-sector stakeholders.

Internal research and analysis

Information may be available from national, state and regional health departments as well as from other organizations and groups that focus on the development of eHealth. Research should span both the public and private health sector. Reports from international agencies, such as WHO and ITU, can also be used to support this step.

Stakeholder consultation

Experience suggests that considerable information can be obtained through interviews and consultation with health-sector stakeholders, listed below.

► Individual health-care providers in disciplines such as general practice, medical specialties, nursing, pathology and diagnostics, pharmacy and radiology.

► Health-care provider representatives or industry bodies.

▶ Individuals from national, state, regional and local health departments and organizations, such as:

- health-care service managers and administrators or equivalents

- clinical leaders, directors or equivalents

- chief information officers (CIOs) or equivalents

- representatives of eHealth/health informatics organizations and groups

- health professional staff (or appropriate representative groups).

Other suggestions and insights

A broad focus should be taken to allow identification of useful components within the wider public and private sectors. The fact that something is not referred to as eHealth, or not currently used by the health sector, does not automatically exclude it from being relevant to delivering a national eHealth environment. For example, eGovernment components that have been developed through other programmes could potentially be utilized as part of a national eHealth environment. Examples may include unique identification schemes, ICT infrastructure and organizational components.

It should be ensured that this step does not consume the development of the national eHealth vision. Vision and strategy development projects are often negatively affected by spending too much effort and time collecting and analysing information regarding the current environment. Instead, the focus should be more oriented towards the future environment. To minimize this risk, this step should be time-limited.

It is important, too, that the eHealth strategy team members do not intentionally or unintentionally constrain their thinking during this step. The focus has to be on gathering information on the current eHealth environment, not assessing what the information means for delivering the national eHealth vision. The next stage focuses on understanding the implications for the vision.

CHAPTER 11

Assess opportunities, gaps, risks and barriers

This stage focuses on assessing the current eHealth environment to identify opportunities, gaps and barriers to realizing the eHealth vision.

| Manage the process |
| Engage with stakeholders |

| Establish the strategic context | Draft an initial vision | Identify required components | Assess opportunities and gaps | Refine vision and develop strategic recommendations |
| Learn from trends and experience |

| Gather information on the eHealth environment |
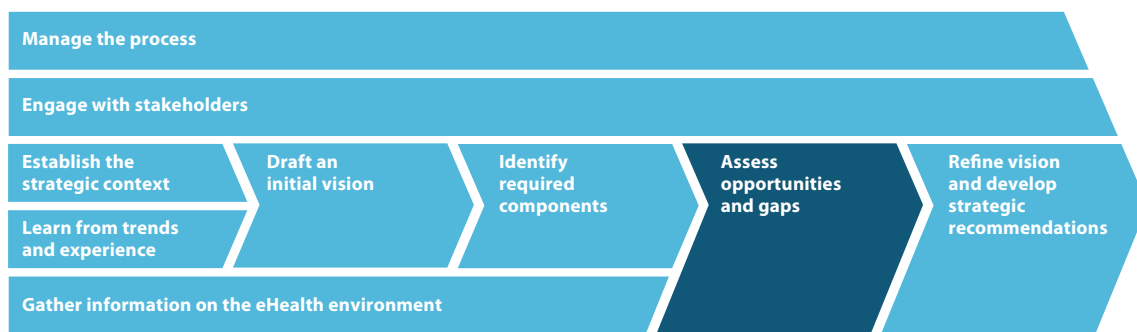
Objective

This stage combines knowledge of the eHealth components and current eHealth environment to identify opportunities for re-using or sharing components, gaps to be addressed, and potential risks or barriers to doing so. This is a critical stage of the process because it will be the basis for refining the draft vision towards an aspirational, but still prgamatic, eHealth vision.

Activities

Assess existing or planned eHealth components against the required components, across the seven common areas:

- ► leadership and governance
- ► strategy and investment
- ► services and applications
- ► infrastructure
- ► standards and interoperability
- ► legislation, policy and compliance
- ► workforce.

Outputs

A description of:

- ► existing eHealth components that might be re-used or shared by a national eHealth environment
- ► eHealth components that do not exist and will need to be developed
- ► the risks and barriers associated with opportunities and gaps identified.

11.1 Assess existing eHealth components against required components

Objective

This stage focuses on identifying three main elements.

▶ *Re-use and sharing opportunities:* What existing eHealth components can be used in the delivery of the national eHealth vision?

▶ *Gaps:* Where are there no suitable existing eHealth components identified as needed in the draft vision?

▶ *Risks and barriers:* What risks and barriers may affect the ability to deliver the required eHealth components?

The required eHealth components (Chapter 8) are compared with the existing eHealth components (Chapter 10) to determine the opportunities, gaps, risks and barriers (Figure 11).

Figure 11. Identifying leverage opportunities, gaps, risks and barriers
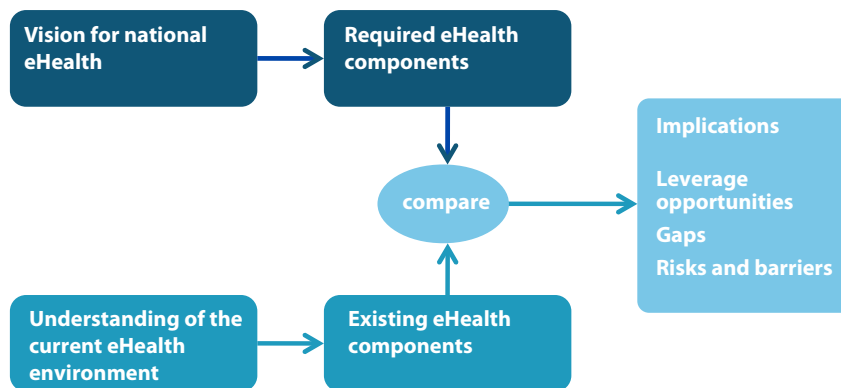
Identify re-use and sharing opportunities

Questions below assist in identifying re-use and sharing opportunities.

▶ What existing or planned eHealth components could partially or completely deliver a required eHealth component?

▶ What is the timeline for the delivery of planned eHealth components, and what is their delivery dependent upon (e.g. legislation, funding, policy, other components, etc.)?

▶ How would an existing (or planned) eHealth component need to be modified to permit it to be used within the national eHealth environment?

▶ What would be the broad timeframes for modifying or extending existing components?

▶ What would be the broad costs to modify or extend existing components?

▶ Which stakeholders should be consulted on the use of an existing or planned component?

Identify gaps

Questions below to assist in identifying gaps.

▶ Which required eHealth components in the draft vision have no existing components to build on (components do not exist or are inadequate)?

▶ What investment in eHealth components will be required to support these gaps, including where an existing (or planned) component needs to be augmented or extended as it only partially delivers a required eHealth component?

▶ What actions or activities need to occur as part of this investment?

▶ Does undertaking these activities depend on any other investment (e.g. legislation, funding, policy, other components, etc.)?

▶ What would be the broad timeframes for making this investment?

▶ What would be the broad costs to deliver this investment?

▶ Which stakeholders should be consulted and involved in designing, implementing and operating these investments?

Identify risks and barriers

Questions below assist in identifying risks and barriers.

▶ What risks and barriers are associated with using an existing or planned eHealth component in the national vision? Examples of potential risks include:

- ability to engage effectively with and gain the support of stakeholders
- availability of skills, knowledge and expertise
- existing culture practices and attitudes, and resulting adoption of eHealth
- existing legislation and regulatory frameworks
- existing health and other government policy
- clinical quality and safety
- privacy and security of personal health information
- dependencies on other eHealth components
- stability and continuity of political and bureaucratic health-sector leaders
- availability of investment funding
- ability to achieve consensus, buy-in and action across stakeholder groups.

▶ What would be the impact on the eHealth vision of not addressing these gaps?

▶ Do any of the risks and barriers highlight missing eHealth components?

▶ What actions should be taken to mitigate these risks and barriers?

Recommended outputs

This stage should produce a description of the re-use and sharing opportunities, gaps, and associated risks and barriers for delivering the initial national eHealth vision.

Approach

This stage requires a combination of internal assessment supported by consultation with stakeholders to validate and refine the outcomes of the assessment.

Internal assessment

The assessment process should include four steps:

1. Compare eHealth components required by the initial eHealth vision with the understanding of the components that exist or are planned to exist in the current eHealth environment.

2. Identify and describe the opportunities to re-use or share existing eHealth components.

3. Identify and describe the gaps in delivering the components required by the initial eHealth vision (i.e. those instances where there appears to be no suitable existing components in the current eHealth environment).

4. Identify and describe the risks and barriers identified during the analysis of re-use and sharing opportunities and gaps, along with any other broader sectoral or environment risks and barriers that should be considered.

Stakeholder consultation

Stakeholders should be consulted to confirm whether eHealth components can indeed be re-used or shared, as well as additional considerations, risks and barriers that may have to be considered. This input can be used to validate or refine the assessment. There may not be an immediate stakeholder, or set of stakeholders, associated with a particular gap, risk or barrier. In this case a stakeholder reference group[11] may identify stakeholders who should be consulted.

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11 The role of a stakeholder reference group is discussed as part of the recommended approach to governing the development of a national eHealth vision (Section 4.2).

CHAPTER 12
Refine vision and develop strategic recommendations

This stage focuses on refining the initial vision for eHealth and developing a set of strategic recommendations.

Manage the process				
Engage with stakeholders				
Establish the strategic context	Draft an initial vision	Identify required components	Assess opportunities and gaps	Refine vision and develop strategic recommendations
Learn from trends and experience				
Gather information on the eHealth environment				
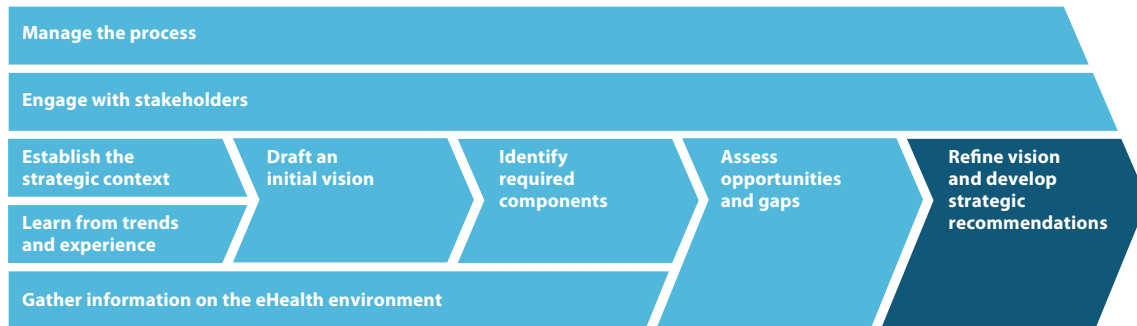
Objective

This stage refines the initial 'unconstrained' vision by considering the opportunities and gaps that have been identified, along with other risks and barriers to the delivery of a national eHealth environment. This creates an aspirational yet pragmatic vision for national eHealth. A set of strategic recommendations to deliver this refined vision is also developed during this stage, and forms the primary input into Part 2 of this Toolkit.

Activities

▶ Adjust the scope and focus.

▶ Refine the initial vision.

▶ Develop strategic recommendations.

▶ Gain endorsement and communicate national eHealth vision and strategic recommendations.

Outputs

▶ An aspirational yet pragmatic vision for national eHealth.

▶ A set of strategic recommendations for delivering the required eHealth components, applications and services that underpin the refined vision.

▶ Endorsement of the vision recommendations by decision-makers.

▶ Communication of the vision to the broader stakeholder community.

12.1 Adjust scope and focus

Objective

Countries will have varying commitment, components and resources to implement a national eHealth vision, and will also be starting their eHealth journey from quite different points. This means that some countries will be able to focus on delivering all the eHealth components identified in Chapter 9, while others will focus on a subset of these. Prioritization is an iterative process, influenced by internal and external factors (Table 24).

Table 24. Internal and external factors in eHealth prioritization

Type	Description	Examples
Internal	Knowledge and insights developed over the course of developing the national eHealth vision.	• Opportunities to re-use or share existing components • Gaps that need to be filled • Risks and barriers associated with opportunities and gaps • Dependencies on the establishment of other components • High-level estimates of the magnitude of funding and duration to establish the required components
External	Guidance and direction provided by political and health sector decision makers and stakeholders.	• Desire for a national eHealth vision and how it should balance: – short-term eHealth outcomes (1–3 years) – long-term eHealth outcomes (5– 10 years). • Opinions on what is likely to be achievable within the timeframe given the political and health sector landscape • Likely available resources and funding that the country has (or will have) to direct towards implementing the vision

This process examines the vision against the following criteria: (1) is it realistic, given the opportunities, gaps and risks; (2) do eHealth outcomes align with health priorities; and (3) is there enough support?

It is not the intention of this step to develop a detailed roadmap of prioritized activities, but rather to identify the broad set of eHealth components that should be delivered within the timeframe of the national eHealth vision (Part 2 of the Toolkit focuses on the development of a national action plan). It is also not the focus of this stage to develop a detailed business case, covering benefits and costs. While funding is explored briefly during this stage, and in more detail in Part 2, the development of a detailed business case is beyond the scope of the Toolkit.

Recommended outputs

This step should describe the eHealth components that will be delivered and the rationale for their selection.

Approach

This step is an iterative process consisting of internal analysis, supported by consultation with political and health-sector stakeholders (Figure 12, Table 25).

Figure 12. Steps for refining the eHealth vision
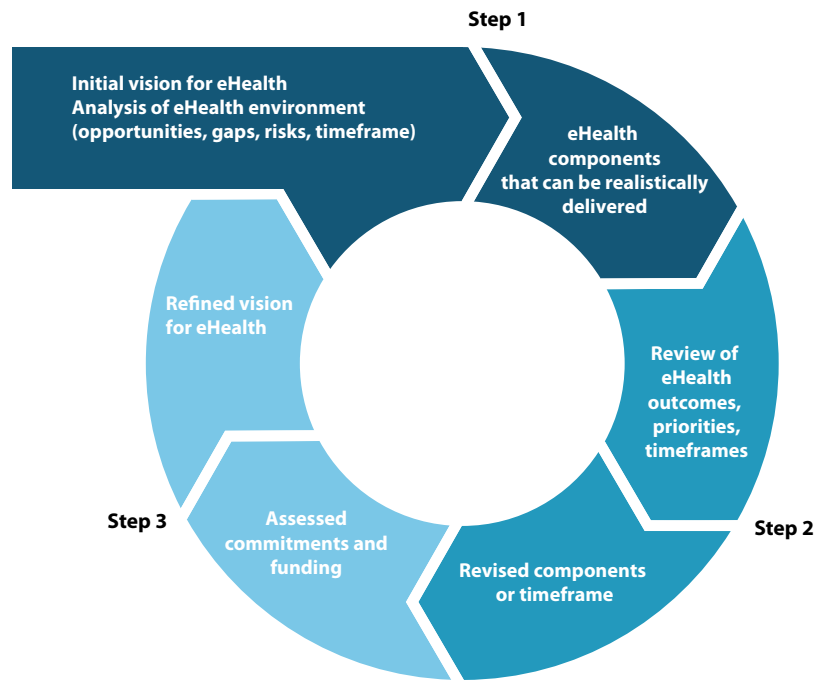
Table 25. Steps for refining the eHealth vision

Step	Inputs	Sample questions	Possible outcomes
1	**Analysis of eHealth environment:** • **re-use and sharing opportunities** • **gaps** • **risks and barriers** • **vision timeframe**	• Given the identified re-use and sharing opportunities, gaps, risks and barriers, which eHealth components could realistically be put in place within the required timeframe? • What do political and health-sector stakeholders think can be realistically delivered within the required timeframe?	An understanding of the eHealth components that can be realistically delivered within the desired timeframe.
2	• **Outputs of step (1)** • **Understanding of health system outcomes** • **Understanding of population health outcomes** • **Understanding of non-health sectoral outcomes**	• What health system, population health and broader non-health sectoral outcomes will the proposed eHealth components enable? • How well do these outcomes align with short- and long-term strategic health priorities?	An optimized set of eHealth components; or a need to revisit the timeframe for the national eHealth vision.
3	• **Outputs of step (2)** • **Political commitment for national eHealth vision** • **Stakeholder commitment to national vision** • **Likely funding that will be available to deliver the vision**	• Are these outcomes acceptable to political and health-sector decision-makers and stakeholders? • Given the funding that will likely be available, what eHealth components can be delivered? • Should the health system goals and challenges be revisited to limit or extend the scope of eHealth components that should be delivered?	A supported and prioritised set of eHealth components; or a need to revisit the strategic health priorities that the vision should respond to; or a need to revisit the timeframe for the national eHealth vision.

While the above diagram and table would suggest a structured and linear approach to this prioritization, in reality the process needs to be flexible in moving between these various steps as knowledge and direction is provided by political and health-sector stakeholders. It is also important to recognize that this step focuses on prioritization at a strategic level, not a programme planning level. Detailed planning and associated prioritization is the focus of Part 2 of this Toolkit.

12.2 Refine the initial eHealth vision

Objective

This step refines the initial eHealth vision to reflect the outcomes of the prioritization process. Below are examples of the types of questions that should be explored.

▶ How effectively can the eHealth outcomes defined in Chapter 8, Section 8.2, be achieved with the prioritized set of eHealth components?

▶ What revision to the eHealth outcomes is required to reflect accurately the prioritized set of eHealth components?

▶ What changes to the initial vision statement for eHealth is required as a result of revision to the eHealth outcomes?

▶ What do these changes mean for each of the stakeholder groups for whom the initial eHealth vision was originally described, and how do these descriptions need to be updated?

▶ What changes to the eHealth strategic architecture models are required?

Recommended outputs

This step should update the outputs developed in Chapters 8 and 9 to reflect the prioritized set of eHealth components. Outputs to be updated include:

▶ eHealth outcomes (Section 8.2)

▶ the eHealth vision statement (Section 8.4)

▶ descriptions of what the vision means for important stakeholder groups (Section 8.5)

▶ scenarios that demonstrate the vision in practice (Section 8.6)

▶ eHealth strategic architecture models (Section 9.8).

Content that is no longer required is maintained rather than deleted, and referred to as potential future directions for eHealth. This ensures that work is not lost and can be revisited at a later point in time, potentially as part of the process of revising the national eHealth vision.

Approach

This should be an internal activity, because it focuses on refining previously developed material. The outputs of this step should be reviewed by the stakeholders who were originally involved in the development of the initial eHealth vision.

12.3 Develop strategic recommendations

Objective

This step describes the strategic recommendations for delivering the refined eHealth vision. Strategic recommendations should be high-level, focused on outcomes, and should be described for each of the seven common eHealth component areas that have been used throughout this process.

Strategic recommendations describe the high-level actions required to deliver the national eHealth environment. These actions may describe how new eHealth components will be

delivered, or how existing eHealth components will be repurposed or extended. Dependencies between strategic recommendations should also be identified, along with the associated risks and barriers. An understanding of dependencies, risks and barriers will form an important input into Part 2 of this Toolkit.

Recommended outputs

Each strategic recommendation (Box 10) should be uniquely referenced to enable traceability to the national action plan (to be developed in Part 2) and should include:

▶ the rationale for the recommendation

▶ a description of the high-level actions to be undertaken

▶ dependencies with other recommendations, and the nature of this dependency

▶ risks and barriers.

Actions are indicative and are intended to assist with understanding the implications of the strategy. These actions will be refined during the detailed planning conducted in Part 2.

Box 10. Example of a strategic recommendation for a national eHealth vision

eHealth infrastructure components			
Form the core foundations for electronic information exchange across geographical and health-sector boundaries			
Strategic recommendations			
Ref	**Recommendation**	**Rationale and specific actions**	**Dependencies**
R.1	**Implement a unique national health identification regime and service**	There is an urgent need to design, build and implement an identification and authentication regime for individual health information, as this service is fundamental to the country's ability to securely and reliably access and share information. It includes functions to uniquely identify individuals, care providers and care provider organizations to ensure that information about the right person is sent to the right care provider. Identification services should include the allocation and management of unique identifiers and the provision of directories that allow providers to be located by name and type of services. Specific actions would include: • undertake design and build a national unique health identification (UHI) service; • contract service provider to take responsibility for operation of the UHI service based on confirmation of provider's component and capacity to operate and maintain the service. Establish a services contract and service level agreement for the operation of the UHI service; • establish a governance arrangement for oversight of the UHI service operation; • make the allocation of the consumer and care provider national identifiers universal and automatic and mandate their use for the provision of government-funded health services.	R.15, R.17

| R.2 | Establish mechanisms to encourage care providers to invest in the implementation and maintenance of an acceptable baseline of computing infrastructure | A key barrier to eHealth take-up is the relatively poor quality of computing infrastructure (PCs, network connectivity and core patient, clinical and practice management systems) across the health sector. To provide the infrastructure foundations to support eHealth there is a need to encourage care providers and organizations to invest in an acceptable base of computing infrastructure.

Specific actions would include:
• persuading national and state governments and authorities to invest sufficient funds in the establishment and maintenance of an acceptable baseline of computing infrastructure;
• linking care provider accreditation to computing infrastructure investment. | R.24, R34 |

Approach

This step should be an internal activity that will involve brainstorming and working sessions to formulate a set of recommendations that collectively deliver the eHealth components underpinning the refined actions. The strategic recommendations should be tested and refined with stakeholders, who should provide input on each recommendation.

12.4 Gain endorsement and communicate national eHealth vision and strategic recommendations

Objective

This step involves obtaining endorsement of the finalized national eHealth vision and associated strategic recommendations, and then communicating these to the broader stakeholder environment. It concludes the development of the national eHealth vision and marks the beginning of the transition towards the development of the action plan.

Recommended outputs

This step will produce the above endorsements by the appropriate decision-maker(s) and communicate them to the broader stakeholder community. It also facilitates their understanding and support ahead of the development of the action plan.

Approach

This step involves presenting, reviewing and obtaining endorsement of the national eHealth vision and associated recommendations by the appropriate decision-maker(s). This will typically be the steering committee that was established to govern the development of the national eHealth vision.

Once endorsed, the national eHealth vision and strategic recommendations should be published and communicated to the broader stakeholders and public. This launches a period of education and awareness building of the national eHealth vision and what it will mean for the country. This period requires listening and responding appropriately to views, opinions and feedback. Some input may also trigger adjustment to some aspect of the vision or recommendations.

The period of education, awareness building and listening will vary in duration, depending on the urgency to proceed with developing an action plan. For example, some countries may opt to have a period of broader consultation regarding the national eHealth vision and recommendations, potentially in the form of inviting public submissions and comments. This

may precede the final refinement of the national eHealth vision. Another country may be comfortable that stakeholder engagement was sufficient and that developing the action plan should proceed.

This period may also overlap with the mobilization of the team that will be responsible for the plan's development. These activities are described in Part 2 of this Toolkit. Part 2 also concerns the need to revise the national eHealth vision to reflect the availability of funding.

Examples of eHealth

These examples are taken from the Global Observatory for eHealth (http://www.who.int/goe/en).

Electronic medical records (EMRs)

An EMR is a computerized medical record used to capture, store and share information between health-care providers in an organization, supporting the delivery of health services to patients. EMR systems may stand alone or may be integrated with other information systems in a health services organization. They function as the legal record created during the provision of care to the patient.

Electronic health records (EHRs)

An EHR is a computerized health record used to capture, store, access and share summary information for a patient between health-care organizations and providers. Examples of information include demographics, medical history, medication and allergies, immunizations, discharge summaries and other summary information. Typically, EHRs are developed to support the provision of care across health-sector or geographical boundaries. They may also be used by individuals and their caregivers to take a more active role in the management of their own health.

Personal health records (PHRs)

A PHR is a computerized health record created and maintained by an individual who is proactive in the management of her or his own health. The record can be private, or made available to health-care providers. PHRs can store a diverse range of information such as an individual's allergies, adverse drug reactions, chronic diseases, family history, illnesses and hospitalizations, medications, diet and exercise plans, and test results.

Telemedicine (telehealth)

Telemedicine supports the provision of health-care services at a distance; that is, the individual and health-care providers need not be in the same location. Telemedicine enables the delivery of safe and quality care to individuals living in areas with limited access to services. Examples of telemedicine services are provided below.

▶ Store-and-forward services involve acquiring medical data (e.g. images) and transmission to a health-care provider (e.g. doctor or medical specialist) for offline assessment and treatment recommendation. Examples include teleradiology and telepathology.

▶ Remote monitoring services enable health-care providers to monitor an individual's condition remotely, using technologies such as implanted devices and sensors with wireless or wired connections.

▶ Interactive services enable real-time interaction between an individual and her or his health-care provider through means such as telephone, web conference, video conference, and other forms of online and remote communication. Psychiatry and mental health services are classic examples.

Telecare services enable care and support to older individuals and those with special needs. This helps them to remain independent in their homes and increases their sense of connectivity with the broader community. Services include alerts (e.g. domestic accidents such as falls) and monitoring (e.g. vital signs, blood glucose, weight).

Mobile health (mHealth)

mHealth describes services and information provided through mobile technology, such as mobile phones and handheld computers. mHealth has emerged rapidly in developing countries as a result of the large penetration of mobile phones and the lack of other, modern health infrastructure.

Examples include the use of mobile devices for:

- ▶ data collection for surveillance and public health (e.g. outbreak investigation)
- ▶ real-time monitoring of an individual's health
- ▶ treatment support, health advice and medication compliance
- ▶ health information to practitioners, researchers and patients
- ▶ health education and awareness programmes
- ▶ diagnostic and treatment support, communication for health-care workers.

Decision support systems

Decision support systems assist health-care providers in making diagnosis and treatment decisions. These systems combine an individual's current and historical health information with the health-care provider's knowledge, to provide advice intended to result in better quality care and outcomes for the individual.

For example, in the area of medication management, decision support tools draw on electronic knowledge sources, such as clinical practice guidelines and knowledge bases, and apply this knowledge to local patient and clinical data through expert rules to guide medications decision-making. Decision support systems, when coupled with a comprehensive and accurate base of patient information, are able to identify potential drug interactions, dosing inaccuracies and prescribing errors that could lead to serious adverse events.

Chronic disease management services

Chronic disease management services are designed to improve coordination and management of care for individuals with chronic conditions. Better tracking of health status, test results, and other parameters enables closer management and prevention of episodes of acute illness or decline in status. Information tracked over time supports individual care planning as well as programme design, resource allocation and research on disease states, benefiting clinicians, administrators, managers and researchers.

Practice, patient and clinical management systems

Practice, patient and clinical management systems refer to the computer systems that health-care organizations use to manage the delivery of care to individuals. These systems provide the ability to capture, store, access and share health information for patients during their care episode. These systems can also provide a broad range of health-care management and delivery functions for a health-care entity, such as diagnostics management, scheduling and resourcing management, clinical care management and reporting. Practice, patient and clinical management systems form one of the foundations required for collecting, recording and sharing electronic information across a country's health sector.

Electronic medication services

Electronic medication services benefit health-care professionals and the general public. Services such as electronic prescribing allow the electronic transmission of prescription information from the health professional to the pharmacy, reducing medication errors and replacing paper-based systems. Online (Internet) medication purchase from certified pharmacies can reduce cost and improve convenience and access to medications.

Health knowledge resources

Health knowledge resources encompass those services that manage and provide access to trusted information to support health-care providers and individuals. Resources include international electronic journals and resource collections, national electronic journals, and national open archives.

Distance learning for health professionals (eLearning)

eLearning services comprise education and training in electronic form for health professionals. eLearning can improve the quality of education, increase access where learning resources are unavailable, or use new forms of learning. Examples of use include continuing medical education for doctors and nurses, and training on preventive services at the household level for community health workers. eLearning tools vary widely, and may allow interaction between the learner and instructor, access to digital libraries and online courses, networks to share experiences, or the use of mobile devices to access information to support delivery of care.

Health information systems

Health information systems facilitate gathering, aggregating, analysing and synthesizing data from multiple sources to report on health situation and trends (disease burden, patterns of risk behaviour, health service coverage and health system metrics). Countries may have in place one or more health information systems supporting reporting on diseases or programmes. They may also have HIS strategies aimed at improving decision-making, policy development, health services management, response to emerging threats and better allocation of health resources.[12]

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12 Health Metrics Network (HMN). Framework for Health Information Systems Strengthening: www.who.int/healthmetrics/documents/framework/en/index.html.

ANNEX B
eHealth benefits

Table 26. Examples of eHealth benefits [13,14,15]

Benefit area	Examples
Access to services	• Ability to deliver basic and enhanced health services to rural and remote communities • Ability for patients to locate health-care providers that offer the services they require • Access to second medical opinion from remote specialists
Efficiency gains in health services delivery	• Enhanced health workforce productivity due to greater efficiencies in obtaining patient information, record keeping, administration and referrals • Improved utilisation of health workforce through remote health-care delivery models
Quality and safety of care	• Increased adherence to best practice by health-care providers; reduced instances of medically avoidable adverse events • Improved ability to monitor compliance to medications and other treatment regimes
Health monitoring and reporting	• Improved ability to support surveillance and management of public health interventions • Improved ability to analyse and report on population health outcomes
Access to health knowledge and education	• Improved access to health-care provider knowledge sources, including medical literature, education, training and other resources • Improved access to consumer health knowledge sources, including health education and awareness, and prevention information for certain health conditions
Operations planning and management	• Improved access to quality data sources to inform health-care service and workforce planning and development
Empowering individuals	• Improved participation of individuals in self-monitoring and chronic disease management • Improved access to trusted health knowledge sources
Innovation and growth	• Increased standardization of information exchange and communication between different segments, agencies and organizations • Increased opportunity for market innovation through access to eHealth standards

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13 Eysenbach G. What is e-health? *Journal of Medical Internet Research*, 2001, 3:e20.

14 *National E-Health and Information Principal Committee. National E-Health Strategy, 30th September 2008.* Adelaide, Deloitte Touche Tohmatsu, 2008.

15 Booz & Co. *Optimising e-Health value – using an investment model to build a foundation for program success.* 2010.

ANNEX C
Structure for a national eHealth vision

A suggested structure for a national eHealth vision document is outlined below. The order of the sections can be modified according to the intended audience. For example, some audiences may prefer to describe the current state of eHealth before outlining the future eHealth requirements. Regardless of the audience, every section should be addressed in the national eHealth vision.

Box 11. Suggested structure for a national eHealth vision

Title

Foreword

Purpose

Audience

How to read this document

 Executive summary

1. Strategic context for eHealth

   1.1   Population health

   1.2   Health system status

   1.3   Strategic health and development goals and challenges

   1.4   Implications for eHealth

2. Vision for eHealth

   2.1   Our national eHealth vision

   2.2   eHealth outcomes for the health system

   2.3   Changes and impact on stakeholders

   2.4   The eHealth vision in practice (optional scenario)

3. Foundations for change

   3.1   Leadership and governance

   3.2   Strategies and innovation

   3.3   ICT services and applications

   3.4   Infrastructure

   3.5   Standards and interoperability

   3.6   Legislation, policy and compliance

   3.7   Workforce

4. Strategic recommendations

ANNEX D
Method summary

This Annex summaries the method described in the Toolkit (Table 27).

Table 27. Method summary

Stage	Activities	Outputs

Gather information about the current eHealth environment	• Develop a broad understanding of the nation's current eHealth environment across the seven component areas:
	  – leadership and governance
	  – strategy and investment
	  – services and applications
	  – infrastructure
	  – standards and interoperability
	  – legislation, policy and compliance
	  – workforce.
		A description of the current eHealth environment in terms of the eHealth foundations, applications and services that exist or are planned for the near term.

Assess the current state of eHealth for opportunities, gaps, risks and barriers	• Identify opportunities for re-using or sharing components, gaps to be addressed, and potential risks or barriers to doing so:
	  – leadership and governance
	  – strategy and investment
	  – services and applications
	  – infrastructure
	  – standards and interoperability
	  – legislation, policy and compliance
	  – workforce.
		A description of:
		• existing eHealth components that might be re-used or shared by a national eHealth environment
		• eHealth components that do not exist and will need to be developed
		• the risks and barriers associated with opportunities and gaps identified.

Refine vision and develop strategic recommendations	• Prioritize eHealth components • Refine the initial vision • Develop strategic recommendations • Gain endorsement and communicate national eHealth vision and strategic recommendations.	• An aspirational yet pragmatic vision for national eHealth • A set of strategic recommendations for delivering the required eHealth components, applications and services that underpin the refined vision • Endorsement of the national eHealth vision and strategic recommendations by decision- maker(s) • Communication of the endorsed vision and recommendations to the broader stakeholder community.
Identify relevant eHealth trends and best-practice	• Research national eHealth visions, strategies and programmes • Research international eHealth trends, best–practice and outcomes.	An understanding of: • how eHealth is being used in similar countries and settings • the types of health system goals or challenges that can be addressed with eHealth • evidence of the specific benefits that eHealth has delivered in similar settings.

Stage	Activities	Outputs
Draft an initial vision	• Agree the time horizon for the national eHealth vision • Define the desired eHealth outcomes based on health goals and challenges • Describe the rationale for each outcome sought; link eHealth outcomes to the strategic context. • Develop an initial vision statement. • Describe what the eHealth vision will mean for stakeholders • Develop one or more scenarios that put the national eHealth vision into practice (optional)	A description of: • the health system outcomes that eHealth should enable or support • the rationale between outcomes and the strategic context for eHealth • the benefits to stakeholders • one or more scenarios that demonstrate the national eHealth vision in practice (optional).

Identify the required eHealth components	• Identify the required eHealth components across the seven component areas:
	  - leadership and governance.
	  - strategy and investment.
	  - services and applications.
	  - infrastructure.
	  - standards and interoperability.
	  - legislation, policy and compliance.
	  - workforce.
	• An eHealth strategic architecture model may also be created to communicate the required eHealth components in a visual manner (optional).
		A description of:
		• the set of eHealth components needed to deliver the national eHealth vision.
		• the relationships and interdependencies between the components.

Gather information about the current eHealth environment	• Develop a broad understanding of the nation's current eHealth environment across the seven component areas:
	  - leadership and governance
	  - strategy and investment
	  - services and applications
	  - infrastructure
	  - standards and interoperability
	  - legislation, policy and compliance
	  - workforce.
		A description of the current eHealth environment in terms of the eHealth foundations, applications and services that exist or are planned for the near term.

Assess the current state of eHealth for opportunities, gaps, risks and barriers	• Identify opportunities for re-using or sharing components, gaps to be addressed, and potential risks or barriers to doing so:
	  - leadership and governance
	  - strategy and investment
	  - services and applications
	  - infrastructure
	  - standards and interoperability
	  - legislation, policy and compliance
	  - workforce.
		A description of:
		• existing eHealth components that might be re-used or shared
		• eHealth components that do not exist and will need to be developed
		• the risks and barriers associated with opportunities and gaps identified.

Refine vision and develop strategic recommendations	• Prioritize eHealth components • Refine the initial vision • Develop strategic recommendations • Gain endorsement and communicate national eHealth vision and strategic recommendations.	• An aspirational yet pragmatic vision for national eHealth • A set of strategic recommendations for delivering the required eHealth components, applications and services that underpin the refined vision • Endorsement of the national eHealth vision and strategic recommendations by decision maker(s) • Communication of the endorsed vision and recommendations to the broader stakeholder community.

ANNEX E
National eHealth component map

A detailed component map can be used as a basis for identifying and assessing eHealth components (Figure 13). The sample component map has been split across two pages for readability.

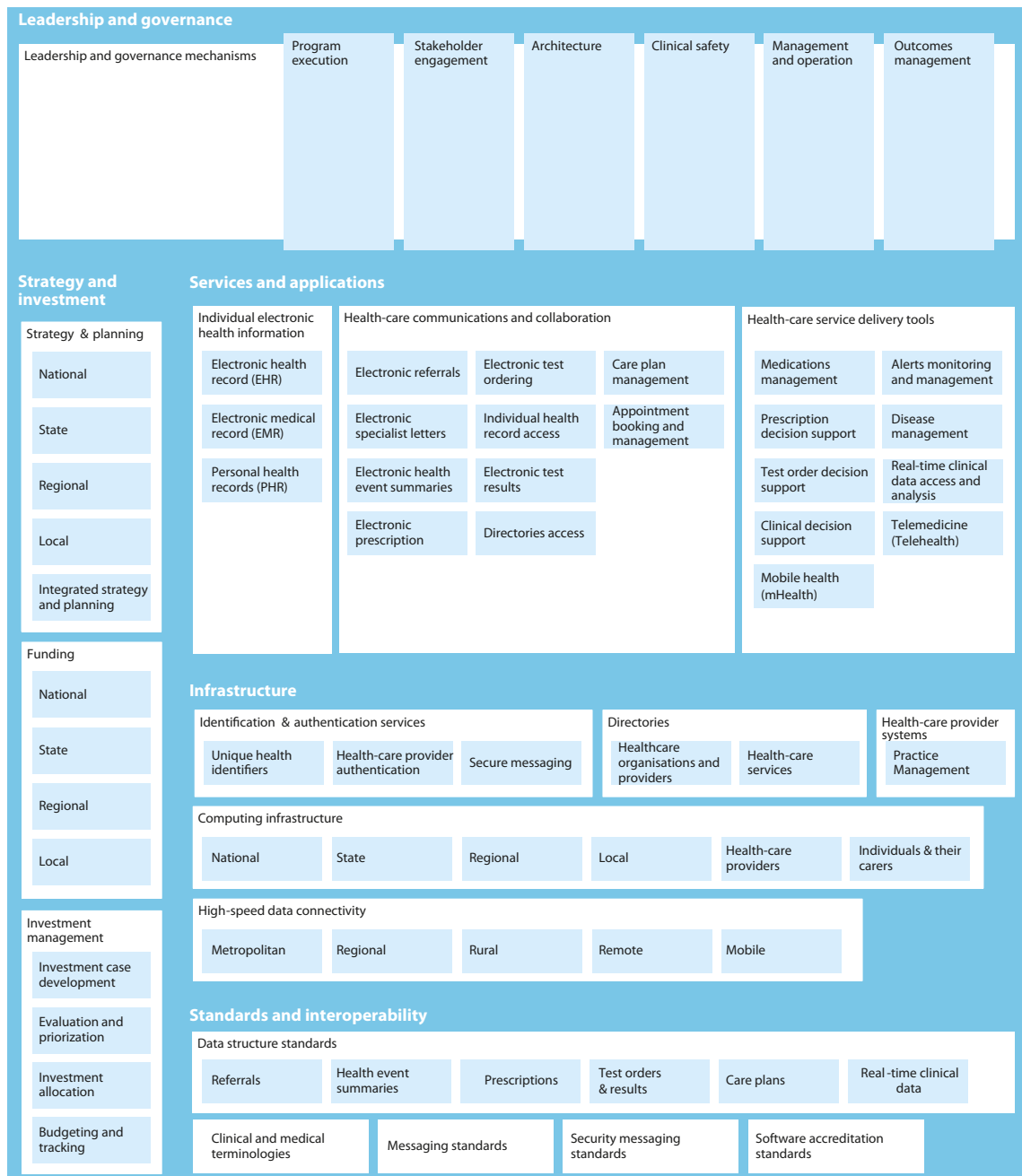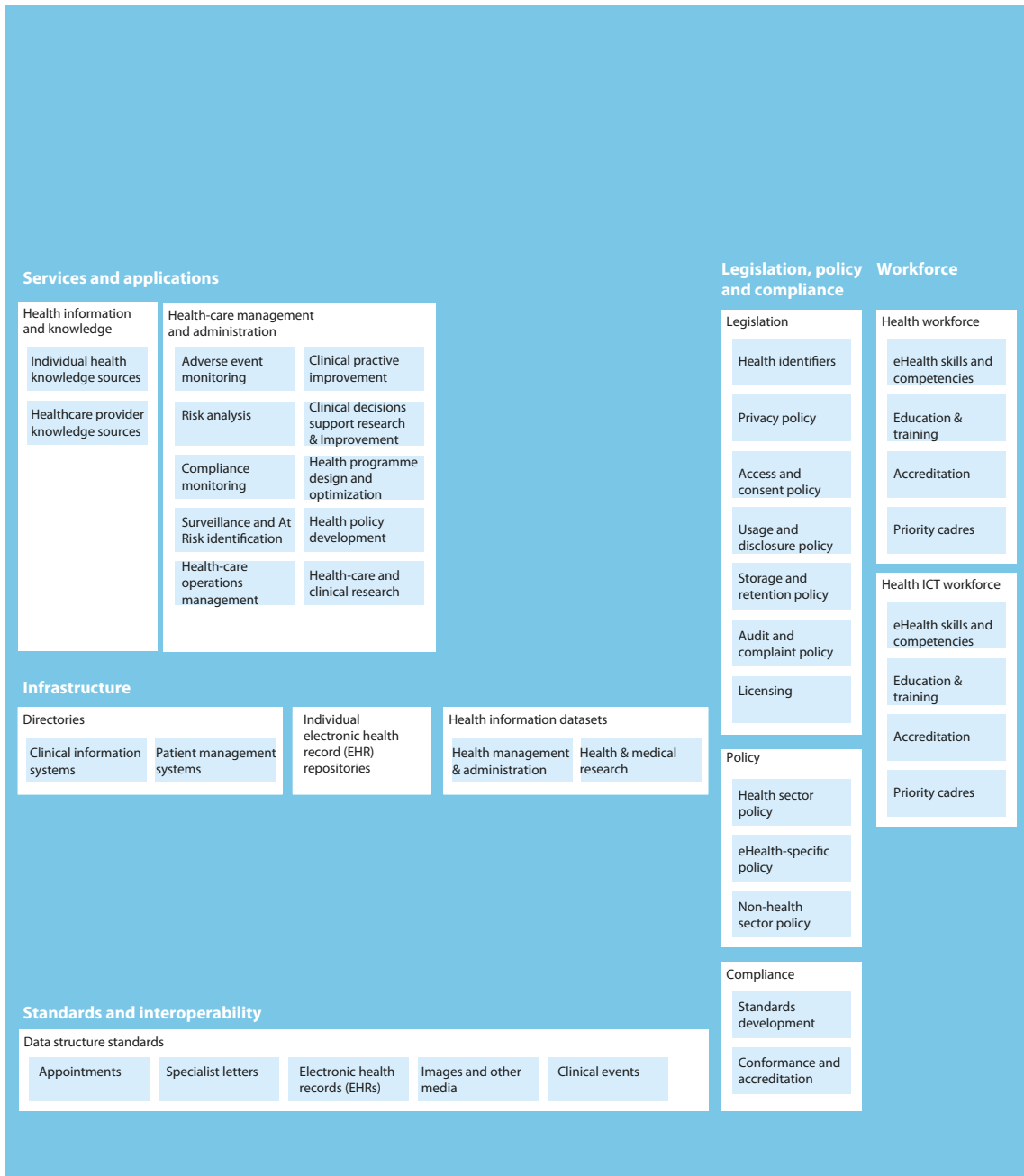**Figure 13. National eHealth component map: example**
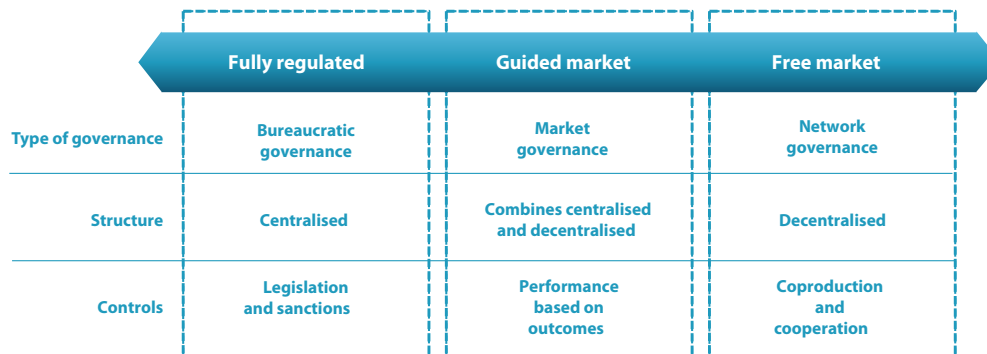
Figure 13. National eHealth component map: example

Services and applications

Health information and knowledge
- Individual health knowledge sources
- Healthcare provider knowledge sources

Health-care management and administration
- Adverse event monitoring
- Risk analysis
- Compliance monitoring
- Surveillance and At Risk identification
- Health-care operations management
- Clinical practive improvement
- Clinical decisions support research & Improvement
- Health programme design and optimization
- Health policy development
- Health-care and clinical research

Infrastructure

Directories
- Clinical information systems
- Patient management systems

Individual electronic health record (EHR) repositories

Health information datasets
- Health management & administration
- Health & medical research

Standards and interoperability

Data structure standards
- Appointments
- Specialist letters
- Electronic health records (EHRs)
- Images and other media
- Clinical events

Legislation, policy and compliance

Legislation
- Health identifiers
- Privacy policy
- Access and consent policy
- Usage and disclosure policy
- Storage and retention policy
- Audit and complaint policy
- Licensing

Policy
- Health sector policy
- eHealth-specific policy
- Non-health sector policy

Compliance
- Standards development
- Conformance and accreditation

Workforce

Health workforce
- eHealth skills and competencies
- Education & training
- Accreditation
- Priority cadres

Health ICT workforce
- eHealth skills and competencies
- Education & training
- Accreditation
- Priority cadres

ANNEX F
Governance continuum

The governance model for the national eHealth vision will depend on the country context and the role of the government (Figure 14).

Figure 14. Governance continuum[16]

	Fully regulated	Guided market	Free market
Type of governance	Bureaucratic governance	Market governance	Network governance
Structure	Centralised	Combines centralised and decentralised	Decentralised
Controls	Legislation and sanctions	Performance based on outcomes	Coproduction and cooperation

Fully regulated

At one end of the continuum is the centralized bureaucratic model under which decisions are mandated, rules and protocols are defined centrally, and there is a heavy reliance on direct supervision to ensure enforcement and adherence. If applied to eHealth, the centralized bureaucratic leadership and governance model would drive eHealth adoption from a central mandate and all aspects of eHealth would be implemented through large-scale national or state programmes and projects.

Free market

At the other end of the continuum is the free-market model in which there is no clear central authority and a reliance on external parties such as customers, care providers and suppliers to produce outcomes collaboratively. The free-market model supports collaboration and innovation, allowing grass-roots eHealth initiatives to continue with little or no intervention from a central authority.

Guided market

Between these two extremes lies the guided-market model which balances the need for local initiative and innovation against the need to coordinate centrally specific aspects of implementation. The guided-market model is characterized by central coordination in areas of national significance, combined with greater flexibility and reduced central control and regulation in areas where the market is best positioned to play a role. The model relies on competition and the use of incentives, funding and compliance mechanisms to drive outcomes in the marketplace.

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16 Adapted from *National E-Health and Information Principal Committee. National E-Health Strategy, 30th September 2008.* Adelaide, Deliotte Touche Tohmatsu, 2008.

ANNEX G
Definitions of terms used in the Toolkit

Part	Term	Definition
Part I: **Establishing a national eHealth vision**	Strategic goals and challenges	Strategic health sector goals and challenges and/or other national development goals that can be best supported by eHealth. While there may be many different goals and challenges, only some of these can be directly supported by eHealth.
	eHealth outcomes	What will be achieved or changed through using eHealth, and how will the health system and services change by: • improving the information flows within the health sector • improving electronic access to health services and information.
	eHealth vision	High-level statement that describes the strategic benefits and outcomes for the country in general or for the health system and population through the strategic changes to health system and services introduced by eHealth (eHealth outcomes).
	National eHealth environment	The national eHealth environment is made up of eHealth components representing the enabling and foundation elements for eHealth as well as technical capabilities that form together an 'ecosystem' for eHealth in a country.
	eHealth components	The building blocks of a national eHealth environment which will allow the eHealth outcomes to be achieved. They describe what is needed to be introduced or strengthened to achieve the eHealth vision in terms of: • leadership and governance • strategy and investment • services and applications • infrastructure • standards and interoperability • legislation, policy and compliance • workforce.
	Strategic recommendations	Strategic recommendations describe the high–level actions required to deliver the national eHealth environment. These actions may describe how new eHealth components will be delivered, or how existing eHealth components will be repurposed or extended.
Part 2: **Developing an eHealth action plan**	Action lines	Broad areas to group national activities of similar focus and intent that are required to deliver a nation's eHealth vision.
	eHealth outputs	The specific achievements, deliverables, results or changes required to deliver a strategic recommendation.
	Activities	The set of activities which need to be undertaken to deliver a particular output.
Part 3: **National eHealth monitoring and evaluation guidelines**	Output indicators	Indicators that provide insights into the adoption and take-up of eHealth within the country's health sector.
	Outcome indicators	Indicators that provide insights into the tangible results for stakeholders that arise from the adoption and use of eHealth.

World Health Organization

ITU

Worldwide, the application of information and communication technologies to support national health-care services is rapidly expanding and increasingly important. This is especially so at a time when all health systems face stringent economic challenges and greater demands to provide more and better care, especially to those most in need.

The *National eHealth Strategy Toolkit* is an expert, practical guide that provides governments, their ministries and stakeholders with a solid foundation and method for the development and implementation of a national eHealth vision, action plan and monitoring framework. All countries, whatever their level of development, can adapt the Toolkit to suit their own circumstances.

Representing one of the most significant collaborations in recent years between the World Health Organization and the International Telecommunication Union, the Toolkit is a landmark in understanding what eHealth is, what it can do, and why and how it should be applied to health care today.

Cover art: base map made with Natural Earth; illustration by Marilyn Langfeld

National eHealth Strategy Toolkit

PART 2

Developing a National eHealth Action Plan

World Health Organization

ITU

National eHealth Strategy Toolkit

Developing a National eHealth Action Plan

PART 2
Developing a national eHealth action plan

Purpose

Part 2 of this Toolkit builds on the national eHealth vision that was articulated in Part 1. Using the results obtained from there as the starting point, it now moves forward to discuss how the vision can be achieved through the development of a comprehensive, well-structured national action plan for eHealth.

A country embarking on a national eHealth strategy will shape the action plan to reflect its own unique circumstances, constraints and priorities. The primary value of this exercise is to enable a government to plan eHealth activities and funding over the short- to medium-term, while building a solid foundation for investment and growth over the longer term.

The action plan can be regarded as a self-contained document that will be widely published for all the country's eHealth stakeholders and other interested parties to read and refer to in order to understand and begin to implement the plan.

Some elements of it will be unavoidably and of necessity complex. Nevertheless, efforts to render it accessible and understandable to a wide audience are worthwhile, and on this basis a definition of terms frequently used is provided in Annex G. This approach benefits not just the immediate readership, but those – including ultimately the general public – to whom the plan and its main elements should be championed and communicated. An example of how to construct this document and shape it into chapters or sections is contained in Annex A. The running order of the sections should be modified as necessary according to the particular intended audience.

Audience

The complete, three-part Toolkit is a guide for government health-sector leaders in ministries, departments and agencies who will manage the development of an eHealth strategy and action plan for their country. Building the plan begins with understanding what it should do (Part 1), which was particularly directed towards a political audience that has to win endorsement and support for the goals of the strategy. It also included professionals, working largely but not exclusively within a government, and already familiar with the current and potential applications of information communication technologies (ICTs) to health.

The intended audience for Part 2 is also political, but more directed towards those who will be implementing the plan, including the stakeholders described in Part 1 and referred to again in Part 2, and their involvement is crucial.

The main readership of Part 2 therefore is decision-makers who have developed a national eHealth vision through other means and who seek to develop their own plan for its implementation. As with all three parts of the Toolkit, successful application of the plan requires a team experienced in strategic planning, analysis and communication. The focus of Part 3 will be on ensuring that the plan does what it is supposed to do, refining and redirecting it if necessary, and if done well, also informing practice in other countries.

Toolkit overview

To recap from the general introduction, the Toolkit provides a framework and method for the three-part development of a national eHealth vision, an action plan and a monitoring framework, with the second and third parts building progressively on the work of Part 1.

▶ Part 1: A national eHealth vision that responds to health and development goals.

▶ Part 2: A national eHealth action plan that reflects country priorities and the eHealth context.

▶ Part 3: A plan to monitor implementation and manage associated risks.

Part 1
National eHealth vision

Part 2
National eHealth action plan (This document)

Part 3
National eHealth monitoring and evaluation
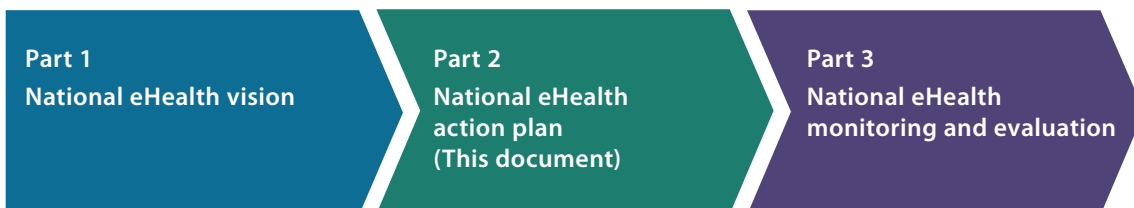
Orientation to Part 2

Part 2 consists of nine chapters and six annexes:

▶ Chapters 1 and 2 provide guidance on managing the process and working with stakeholders.

▶ Chapter 2 summarizes the outputs from Part 1 to be used as the starting point for developing the action plan.

▶ Chapter 3 describes the main elements and method by which an action plan for eHealth is developed.

▶ Chapter 4 is concerned with engaging further with stakeholders in developing the plan.

▶ Chapters 5–9 provide detailed guidance on each stage of the planning process.

The annexes provide additional information to support this Toolkit, including a definition of terms and a suggested structure for the plan document.

Contents

Part 2. Developing a national eHealth action plan

Chapters

Annexes

Figures

Boxes

Tables

INTRODUCTION
From vision to action plan

The national eHealth vision

By this point in the overall process, a government will have established a national eHealth vision by completing Part 1 of the Toolkit. The vision, and recommendations for taking it forward, will have been endorsed by health-sector leaders and supported by the broader stakeholder environment.

The national eHealth vision describes:

▶ the health and development context and specific health goals that eHealth will support;

▶ the outcomes that eHealth is expected to deliver;

▶ the eHealth components required to deliver this vision, taking into account the current eHealth environment; and

▶ the strategic recommendations, including priorities, for putting these components in place.

Part 1 shows why eHealth is required and what a national eHealth plan will deliver.

The eHealth action plan

Part 2, the national eHealth action plan, describes how the eHealth vision will be achieved. It outlines the main action lines and resources required to implement the recommendations from Part 1 (Figure 1).

Figure 1. From vision to action plan

Part 1 **Part 2**

| Vision | Strategic recommendations | Activities | Integrated action plan |
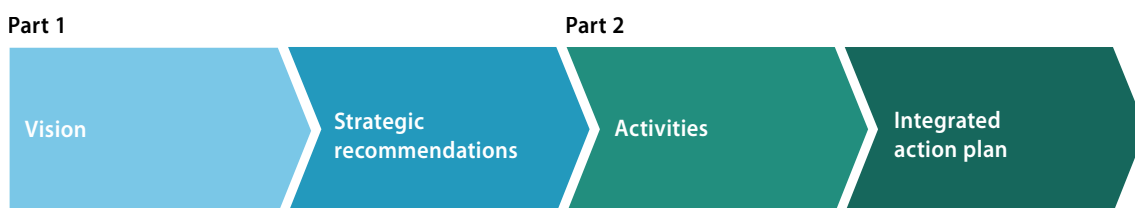
An action plan enables a government to:

▶ identify all components and how they should be governed, funded and coordinated to ensure that results are achieved at a national, state and local level; and to

▶ work closely with multisector stakeholders who will be involved in implementing the plan.

CHAPTER 1
Framework for an action plan

An action plan for eHealth describes the comprehensive set of activities, required resources and strategic phases for implementing the national eHealth vision (Figure 2).

Figure 2. Framework for an eHealth action plan

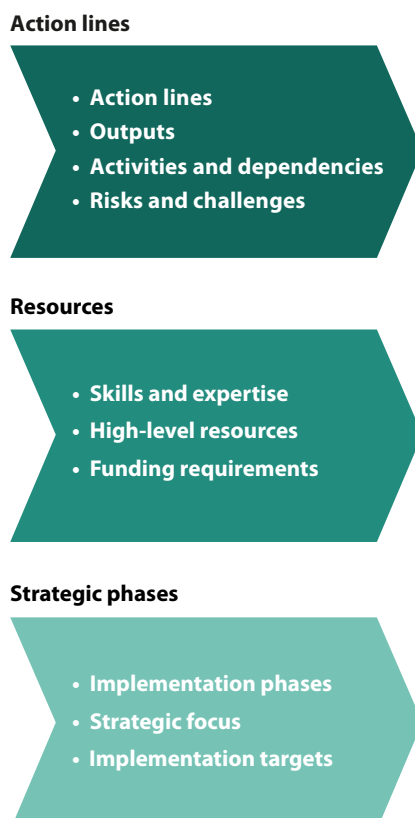**Action lines**

- **Action lines**
- **Outputs**
- **Activities and dependencies**
- **Risks and challenges**

Resources

- **Skills and expertise**
- **High-level resources**
- **Funding requirements**

Strategic phases

- **Implementation phases**
- **Strategic focus**
- **Implementation targets**

1.1 eHealth action lines

The national action plan is based on groups of activities, or action lines, that provide a high-level view of the major areas of work required to deliver the national eHealth vision. The specific activities, deliverables, dependencies and risks are described for each action line.

1.2 Resources

Examples of the resources required to implement an eHealth action plan include human resources – people and their skills and expertise, vendors and suppliers – and infrastructure. Among other considerations, the quality, cost and availability of these resources, and whether they are local or international, will affect the scope, timing and delivery of activities in the action plan. For this reason, resources are carefully considered in the planning stage in order to optimize, share and leverage current and potential resources for implementation.

1.3   Strategic phases

An eHealth action plan is typically complex, with interdependent activities across multiple action lines and a multi-year timeframe. Representing the plan in strategic phases makes planning and funding more logical and practical by defining a specific focus, with priorities, targets and deliverables for each time-limited phase. These phases are described from a high-level perspective in a way that can be understood and communicated by senior political leaders and stakeholders. Plans for initial phases are usually more detailed than for later phases, which may be timed to fit with national planning or budget cycles.

1.4   Suggested structure

The framework in this chapter describes the core components to be considered in developing a national action plan for eHealth. Annex A suggests a structure for the plan, which can be modified as needed for the primary audience.

CHAPTER 2

Developing the national eHealth action plan: overview

Figure 3. A method for developing an eHealth action plan

A national eHealth action plan is developed as an iterative process, similar to that used in developing the national eHealth vision. First, an initial plan is drafted based on the vision and recommendations developed in Part 1 of this Toolkit. Next, the draft is refined based on a country's constraints (such as resources and funding) and eHealth environment. This approach ensures that the plan is grounded in the current context, but is not overly constrained. It also allows for the identification of activities that could be implemented should additional resources become available. This section summarizes the method, with details provided in Chapters 3 and 5 and a summary table in Annex B.

2.1 Manage the process

The planning process must be effectively managed to produce a plan that corresponds to the vision and recommendations developed in Part 1. A successful process requires health-sector leadership and support, appropriate governance mechanisms, stakeholder consultation, and a core team with technical knowledge, analytical ability and communication skills.

2.2 Engage with stakeholders

Producing an informed and supported action plan requires consultation with multisectoral stakeholders, such as have been described in Part 1, consistent with the government's role and governance of the process. Stakeholders who will be responsible for implementation of the action plan should be involved in its development, to ensure feasibility and facilitate support as the plan is rolled out.

2.3 Develop eHealth action lines

The development of an action plan begins with defining the activities required to deliver the national eHealth vision and recommendations. Activities are then grouped as action lines, each of which has its own focus, priorities and targets for implementation.

2.4   Develop an integrated action plan

The detailed plans for each action line are integrated to form a comprehensive eHealth action plan. This plan is checked for alignment with the strategic priorities and recommendations from Part 1. The plan is also reviewed to ensure that it is pragmatic and achievable, and that risks are identified and addressed.

2.5   Determine high-level resource requirements

The focus of this step is to identify the skills and expertise required to implement the action plan. Assessing these against the current eHealth environment allows potential constraints to be identified. The quality, cost and availability of resources, and whether they are local or international will affect the scope, timing and delivery of activities. As mentioned in Section 1.2, it is for this reason that resources need to be carefully considered in the planning stage in order to optimize current and projected resources as well as to gauge funding needs.

2.6   Apply funding constraints to refine plan

Identifying and securing financial resources to implement a proposed national eHealth plan will present challenges for many countries. This step outlines the magnitude and timing of potential funding and refines the action plan so that it is realistic and can be implemented in this context.

2.7   Define implementation phases

An action plan can be divided into phases that progressively take a country towards its eHealth vision. A phased approach to implementation is both strategic and practical. Each phase can be used to communicate a complex action plan in a way that stakeholders can understand, and can have defined targets. These help stakeholders understand what each phase should achieve and what progress is being made towards the objectives.

CHAPTER 3
Manage the process

This process focuses on the effective management of the development of the eHealth action plan.

Manage the process				
Engage with stakeholders				
Develop eHealth action lines	Develop an integrated action plan	Determine high-level resource requirements	Apply funding constraints to refine plan	Define implementation phases

Objective

Effective management under the responsibility of a core team ensures that the development of an eHealth action plan is undertaken in a structured and timely manner, with appropriate stakeholder engagement.

Activities

The leadership, governance and management mechanisms established during Part 1 should be continued into the planning process. They are:

▶ maintaining health sector, ministerial and government leadership and support

▶ adapting governance mechanisms established in Part 1 to continue the process of eHealth planning

▶ ensuring that the required programme development skills and expertise are present

▶ defining a timeline and process for developing the plan and ensuring the agreed steps are taken.

Outputs

A credible, well-managed process resulting in a national eHealth action plan informed and supported by stakeholders.

3.1   Health leadership and support

The top-level ministerial and health-sector leadership that was essential to developing a national eHealth vision is now equally important for the development of a national eHealth action plan. Maintaining this support may involve formally recognizing the start of the action planning process. This creates a clear separation from the development of the national eHealth vision, and can be used to focus leaders on the objectives of, and their role in, the next phase of the process. This can also be used to re-energize those involved, following what may have been a complex or lengthy process to develop the national eHealth vision. However, capitalizing on the momentum gained from that exercise and moving immediately after its endorsement to developing the action plan is by far the best way to maintain leadership and support.

3.2   Governance structure and mechanisms

The governance structure from Part 1 can be used for Part 2, with changes to the composition of groups and responsibilities as needed; an example is given below (Figure 4), with details of the mechanisms in Table 1.

Figure 4. Sample governance structure

Table 1. Suggested governance mechanisms for developing an eHealth action plan

Mechanism	Responsibilities	Composition
Health-sector leadership	• Provides high-level oversight and direction • Secures spending authority and resources • Acts as the vocal and visible champion • Supports project management to resolve major problems, conflicts or challenges	Senior health-sector decision-makers, such as the minister of health or the national health policy and strategy council.
Steering committee	• Acts individually and collectively as a vocal and visible champion through their organizations • Assists in resolving issues and conflicts • Reviews and approve changes to the scope • Provides direction and guidance to the core team • Oversees progress • Approves, endorses and owns the eHealth action plan	Those individuals who should be involved in making decisions in relation to the action plan and its support. This group will probably consist of individuals from the stakeholder group of decision-makers (see Chapter 4).
Stakeholder reference group	• Provides input and guidance regarding the development of the action plan • Reviews and provides feedback on draft deliverables	Academics, thought-leaders, health-sector representatives and potential funders who are not involved directly in decision-making but are able to exert a high degree of influence due to their acknowledged eminence in the field, their role as formal or informal advisers to decision-makers, or their ability to influence funding availability. This group will probably consist of individuals from the stakeholder group of key influencers.
Core team	• Manages activities, budget, risks and communication with steering committee • Monitors progress and budget • Develops the action plan • Undertakes consultation with stakeholders	Individuals skilled and experienced in the development of complex, large-scale work programmes involving health-sector change.
Broader stakeholder environment	• Provides input into the identification and definition of activities • Provides input into the skills and expertise required to deliver the action plan, and the availability of these assets in the national and international marketplace	Not involved directly in decision-making, but should be consulted as they may be accountable for delivering activities in the action plan. They may also be a source of subject matter expertise. These individuals and organizations include the activity owners and subject-matter expertise groups.

The governance model suggested in Part 1 can remain largely unchanged to support the development of an eHealth action plan. The main change is that the mechanism for broader stakeholder environment becomes the primary means to consult with those stakeholders who may (1) ultimately be required to deliver activities within the action plan; and (2) can provide subject matter expertise and input to support the planning process.

3.3   Ensure the required skills and expertise are present

The development of an eHealth action plan requires individuals with skills and expertise in the development of strategic programmes for achieving large-scale change within an industry sector. The team will build on the output and knowledge gained from Part 1.

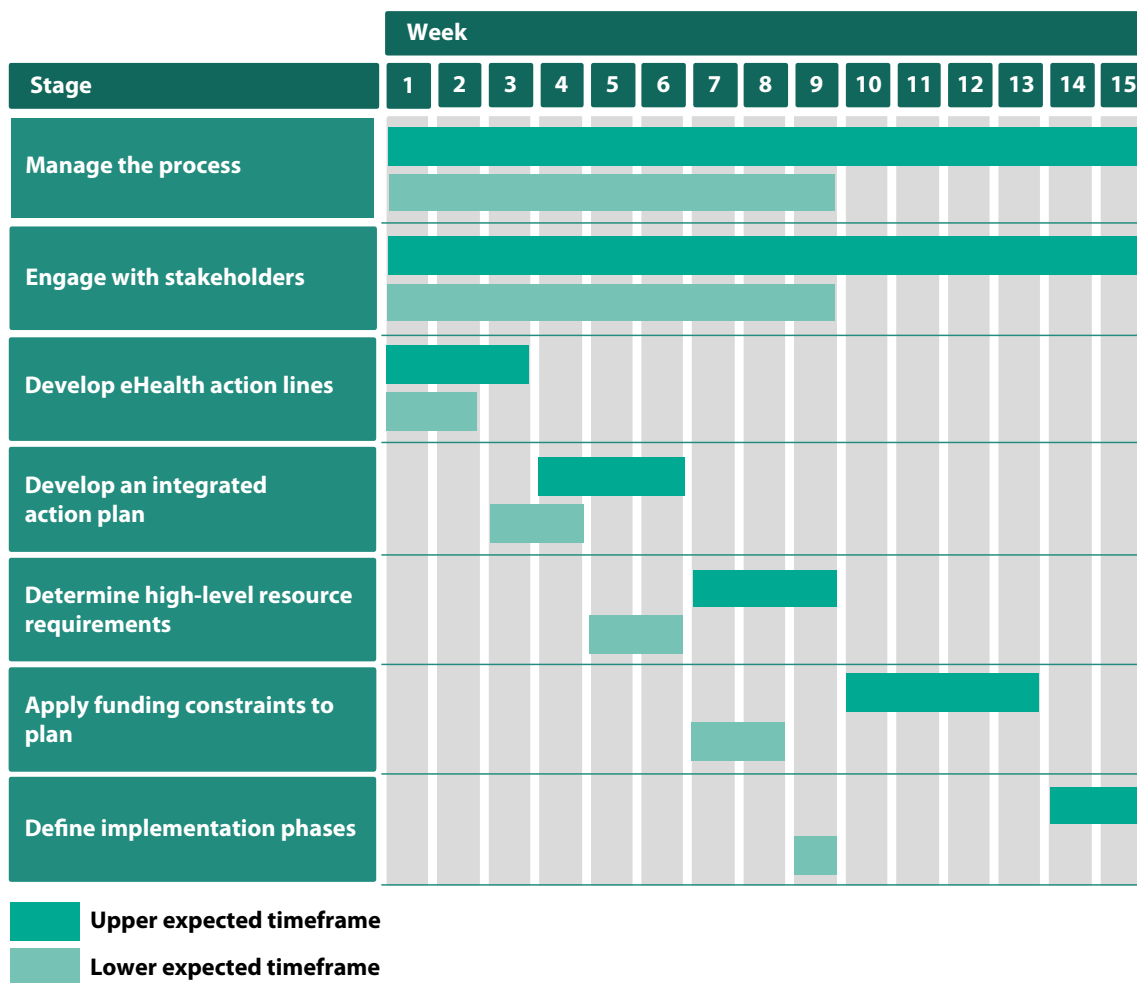The core team for Part 2 should have the following skills and expertise:

▶ management of strategic projects at national level

▶ deep understanding of the national eHealth vision and the strategic context

- ▶ development of large and complex programmes in the health sector
- ▶ estimation of funding or costs for strategic work programmes
- ▶ ability to work effectively with stakeholders
- ▶ ability to use knowledge from international eHealth programmes and projects.

3.4 Determine the timeline

The timeframe for developing an eHealth action plan will vary according to the level of engagement with stakeholders, the scope and complexity of the action plan, and the resources allocated for the work. A suggested range is between nine and 15 weeks (Figure 5).

Figure 5. Sample timelines for developing an eHealth action plan

Stage	Week														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Manage the process															
Engage with stakeholders															
Develop eHealth action lines															
Develop an integrated action plan															
Determine high-level resource requirements															
Apply funding constraints to plan															
Define implementation phases															

■ **Upper expected timeframe**

■ **Lower expected timeframe**

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CHAPTER 4
Engage with stakeholders

This stage focuses on ensuring effective collaboration with stakeholders during the development of the eHealth action plan.

Manage the process				
Engage with stakeholders				
Develop eHealth action lines	Develop an integrated action plan	Determine high-level resource requirements	Apply funding constraints to refine plan	Define implementation phases

Objective

Producing an informed and supported action plan requires consultation with a broad range of multisectoral stakeholders, consistent with the government's role in eHealth. Stakeholders who will be responsible for implementation of the national action plan should be involved in its development, to ensure feasibility and facilitate support as the plan is rolled out.

Activities

Working with stakeholders can be a complex undertaking given the diversity of those who may need to be involved. Managing this complexity requires:

▶ clarifying the role of government

▶ identifying the stakeholder groups to be involved

▶ determining a pragmatic approach to working with the stakeholder groups, which takes account of influencing power, knowledge, skills and expertise

▶ planning where stakeholder consultation will occur during the planning process, and ensuring that it is accomplished.

Outputs

Stakeholders broadly accept and support a pragmatic action plan for eHealth.

4.1   The role of government

Part 1 clarified the role of government in the country's eHealth strategy development. Some strategies are precisely directed, while others emerge in a more collaborative way. As in Part 1, the government's role will now have a direct bearing on how the eHealth action plan is developed and the nature and level of stakeholder involvement.

Table 2. Government's role and implications for planning

Market	Government's role	Implications for planning
Fully regulated	Government drives the development and adoption of eHealth from a central mandate. eHealth is generally implemented through large-scale national or state programmes and projects.	• Government is responsible for developing the main action lines and plan • Limited stakeholder feedback is sought; the plan is primarily driven by the government
Guided market	Government provides central coordination of eHealth in areas of national significance. There is greater flexibility and reduced control and regulation in areas where the health sector and market are best positioned to play a role in developing the eHealth environment.	• Government leads and manages the development of the action plan • Government works with stakeholders to identify required activities, as stakeholders may be responsible for delivering activities within the plan. • Content of the plan is driven by the government and important multisector stakeholders
Free market	Government provides no central authority and limited governance over the development of the national eHealth environment. There is heavy reliance on the market to develop collaboratively the national eHealth environment.	• Government plays a facilitating and advisery role to assist in the development of an action plan, which different stakeholders commit to delivering

4.2   Identify the stakeholders

The health and non-health-sector stakeholders identified in Part 1 should be reviewed to determine their potential engagement in developing the national action plan. Depending on the government's role, some of these stakeholders may be accountable for delivering key activities and therefore should be closely involved in the planning stage. Others may be asked to provide subject matter expertise on a limited basis.

Examples of stakeholders from the health sector that may need to be consulted or invited to participate in developing the action plan include:

▶ health professional associations

▶ hospital and health services associations

▶ academic, research institutes and think tanks

▶ health and disability insurance entities

▶ patient associations

▶ national, state and local public-health and health-care authorities

▶ private care providers including private health organizations, NGOs and charitable affiliates.

Stakeholders from beyond the health sector will also play an important role in delivering the national eHealth vision. They may contribute resources (expertise or services) and may have a strong interest in the outcome of the eHealth environment; for example in creating new business opportunities. Examples of these types of stakeholders include:

- ICT/Telecommunications ministries and service providers
- professional education agencies and academic institutions
- social welfare and community services
- defence and civil protection organizations
- innovation, industry and science representatives
- treasury and finance representatives
- international organizations and donors such as the European Commission, the World Bank, the International Monetary Fund and United Nations specialized agencies.

Health and non-health stakeholders engaged during Part 1 should be analysed to understand how they should be involved in the development of the action plan, as in the example questions below.

- How influential is each stakeholder in the development and adoption of the action plan?
- What expertise or resources may be available to support the development of the action plan?
- What role may the stakeholder be able to play in the implementation of the plan itself?

4.3   Identify stakeholder roles

The stakeholder groups identified in Part 1 should be reviewed, to determine their role (Figure 6 and Table 3). From this the level, focus, frequency and medium of engagement can be planned.

Figure 6. Common stakeholder roles in developing an eHealth action plan

Broader stakeholders
Health professional associations, patient advocacy associations

Subject matter experts
Health ICT industry, health professional associations

Activity owners
Ministries of health, education, development, ICT and telecommunications

Key influencers
Senior executives in key health organizations, academics, advisers, international organizations and donors

Decision-makers
National eHealth steering committees, ICT council

Table 3. Common stakeholder roles

Stakeholder group	Description	Examples
Decision-makers	They set the overall vision and strategic direction for eHealth, and are responsible for approving, endorsing and owning the eHealth action plan. These stakeholders are typically involved in: • making decisions in relation to development of the action plan • the acceptance of the action plan • progressing the delivery of the action plan once it has been approved.	• National eHealth steering committee, including health and ICT ministries • Other government committees or councils into which the steering committee reports (e.g. the steering committee may be a subset of a broader health or ICT committee or council)
Key influencers	They are not involved directly in decision-making, but are able to influence decisions due to their: • acknowledged eminence in the field • role as formal or informal advisers to decision-makers • ability to influence resources available for delivering the action plan.	• Senior executives in key health organizations • Eminent academics • Advisers to steering committee members and relevant government committees and councils • International organizations and donors
Activity owners	They are not involved directly in decision-making, but their potential accountability for delivering many core activities In the plan makes it necessary to consult them.	• National health ministry or department • State health ministry or department • eHealth development agencies • Standards bodies • Health agency executives (e.g. NGOs, hospitals, etc.) • ICT/telecommunications ministries • Professional education agencies and academic institutions
Subject-matter experts	They are not involved in decision-making but are a source of expertise that may assist in defining activities, options and processes for delivering the plan and perhaps influencing its credibility and adoption.	• Vendors and broader health ICT industry • Experts in a particular discipline related to eHealth transformation (e.g. clinical work practice transformation) • Health professional associations
Broader stakeholders	As beneficiaries or clients, they hold public servants accountable for how public funds will be prioritized and used, and how their services will be affected.	• Health professional associations, patient advocacy associations

4.4   Plan approach to stakeholder groups

The approach to engaging with stakeholders should take into account their role and interests (Table 3). Clarifying the approach is a necessary step to determining where and how stakeholders will be consulted during the planning process.

Table 4. Sample approach to stakeholder groups

Stakeholder group	Approach
Decision-makers	Frequent and formal contact to seek input and guidance, present material for final review, and seek acceptance and endorsement of the action plan.
Key influencers	Frequent and more informal contact to seek input, guidance and assistance in forming the action plan.
Activity owners	Targeted consultation and participation to seek input and guidance in identifying and definition of activities required for a particular eHealth action line.
Subject-matter experts	Consulted on an ad hoc basis to seek specialized knowledge in key areas.

4.5 Define where stakeholder consultation will occur

The project planning team should develop a stakeholder consultation plan that describes in detail how and when stakeholders will be engaged, and for what purpose. A structured approach saves time and ensures that all stakeholders are identified and consulted as needed (Table 5). A stakeholder engagement plan should also take into account their availability, and should seek to minimize the number of consultations, interviews and discussions with the same stakeholder.

Table 5. Sample stakeholder consultation plan

Stage	Stakeholder consultation groups			
	Decision-makers	Key influencers	Activity owners	Subject matter expertise
Develop eHealth action line plans	• Consulted to gather broader political, sectoral and other considerations that may influence the definition of eHealth action lines.	• Consulted to gather broader political, sectoral and other considerations that may influence the definition of eHealth action lines.	• Consulted to provide input into the activities required to achieve an output(s) for a particular action line. • Consulted to provide input into the dependencies and risks related to activities.	• Consulted to provide input into the activities required to achieve an output(s) for a particular action line. • Consulted to provide input into the dependencies and risks related to activities.
Develop action plan	• Provide direction regarding options to improve alignment of the plan to the health system and other relevant priorities. • Provide input regarding achievability and risks.	• Provide direction regarding options to improve alignment of the plan to the health system and other relevant priorities. • Provide input regarding achievability and risks.	• Consulted to provide input regarding achievability and risks, in particular areas or activities.	• Provide input regarding achievability and risks in particular areas or activities.
Determine resourcing and funding	• Provide input on policy and other factors that may influence the approach to securing skills and resources required to deliver the action plan.	• Provide input on policy and other factors that may influence the approach to securing the required skills and resources.	• Consulted to provide input on skills and expertise required to deliver their activities. • Consulted to provide input to funding estimates for activities that they helped to identify and define.	Provide knowledge of: • skills and expertise required to deliver specialized activities • the availability of skills and expertise • potential approaches to securing skills and resources required • funding required for other eHealth programmes and projects • costs associated with specialized technology and and non-technology-related activities
Apply funding constraints to refine the action plan	• Provide direction on the likely availability of funding for delivering the action plan. • Consulted as part of evaluation of options for refining the action plan to take account of likely available funding. • Select the preferred option for refining action plan to take account of likely available funding • Review and endorse the refined action plan.	• Provide input regarding potential sources of funding for delivering the action plan. • Consulted as part of evaluation of options for refining the action plan to take account of likely available funding.	N/A, not applicable	• May provide input on funding approaches that other countries have employed for their national eHealth programmes.
Define implementation phases	• Review and endorse implementation phases for the action plan.	• Optionally may be engaged to obtain their feedback on the proposed implementation phases.	N/A	N/A

CHAPTER 5
Develop eHealth action lines

This stage focuses on developing individual plans for each eHealth action line.

Manage the process				
Engage with stakeholders				
Develop eHealth action lines	**Develop an integrated action plan**	**Determine high-level resource requirements**	**Apply funding constraints to refine plan**	**Define implementation phases**

Objective

Developing an eHealth action plan begins with understanding and logically grouping the activities that are required to deliver the national eHealth vision and recommendations developed in Part 1. Grouping activities enables the identification of broad action lines, which in turn form the basis of the eHealth action plan.

Activities

- ▶ Define main action lines.
- ▶ Assign outputs to action lines.
- ▶ Identify the activities required to deliver the outputs of each action line.
- ▶ Identify additional change and adoption activities.
- ▶ Identify dependencies between activities.
- ▶ Develop individual plans for each eHealth action line.
- ▶ Identify risks associated with the delivery of action line plans.
- ▶ Refine eHealth action lines (optional).

Outputs

An indicative plan for each eHealth action line, which communicates the outputs, activities, dependencies, timings and risks.

5.1   Define main action lines

Objective

This step defines the main eHealth action lines that will form the basis of the action plan. Action lines are used to group activities of similar focus or intent. Country experience suggests that the activities required to deliver a national eHealth vision generally fall into one of four broad groups (Table 6).

Table 6. Four common eHealth action lines

Action line	Example characteristics
Governance	• Provides coordination, visibility and oversight of the eHealth action plan (i.e. programme activities). • Develops governance structures and mechanisms to ensure accountability, transparency and effective leadership is in place.
Foundations	• Deliver eHealth components that support secure electronic information exchange across a country's geographical and health-sector boundaries, or improve access to health-care services through electronic channels. • Are of national significance, and too risky or complex to deliver successfully if approached by other means than by a national, coordinated approach. • Are more cost effective to develop only once at a national level rather than duplicating effort and expenditure across states, regions, and private sector.
Solutions	• Encourage the development and use of high-priority eHealth services and applications to improve the efficiency and effectiveness of health system management and care delivery. • Deliver eHealth components that enable individuals, health-care providers and health-care managers to access, view, use and share health information as part of care provision. • Deliver eHealth components that provide the tangible means by which stakeholders will benefit from the national eHealth environment. • Deliver eHealth components that access, interact with and use national foundations and infrastructure to access and share information.
Change and adoption	• Motivate, prepare and support the health system in adopting and using eHealth in health-care management and delivery. • Establish incentives, facilitate the adoption of eHealth services and applications, and change work practices to be able to use eHealth effectively.

The broad action lines described above are one example of a starting point for grouping activities, but it is not essential to finalize them at this stage. As other aspects of the work plan take shape, these action lines can be extended or refined, based on factors such as:

▶ the scope of recommendations from the national eHealth vision (Part 1), and whether there are specific themes or clusters of recommendations that indicate the need for an additional or different action line;

▶ key stakeholders' expectations regarding the inclusion of specific action lines; and

▶ the detail that a government would like to communicate.

The focus at this point should be on developing a high-level plan. Detailed programme planning will take place following approval to proceed with implementation.

Recommended outputs

This step should produce an initial set of action lines that together form the basis of the eHealth action plan. Each action line should have a clearly defined intent or focus. Between four and six main action lines is a manageable structure for an eHealth action plan, and encourages the right level of depth and detail in the plans for each one. A large number of activities should be avoided as this tends to result in a very detailed level of analysis and planning, which can

consume a significant amount of time, for little benefit, given that the focus should be on a high-level plan.

Approach

This step requires a combination of internal analysis, supported by input from stakeholders.

Internal analysis

This step should focus on reviewing the suggested eHealth action lines and determining whether these need to be refined or extended. The action lines should encompass the full range of activities required to deliver the recommendations from Part 1. The components from Part 1 can be mapped to these action lines (Figure 7).

Figure 7. High-level mapping of eHealth components to four common action lines
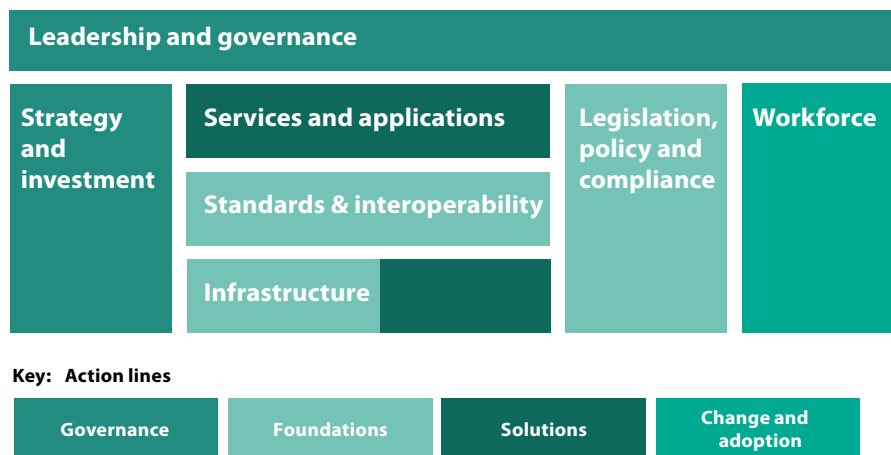
The Infrastructure component may be mapped to both Foundations and Solution action lines depending on a country's definition of the scope of these action lines. It is suggested that activities associated with delivering Infrastructure components be mapped to the Foundations action line. See Annex C for a more detailed representation of Figure 7.

As Part 1 developed strategic recommendations for each eHealth component area, the above mapping may be a useful tool in determining:

▶ where activities associated with strategic recommendations should be mapped to; and

▶ whether eHealth action lines need to be refined or extended as there would appear to be no eHealth action line where an activity could be allocated.

This step requires consideration of the broad range of activities required to deliver each strategic recommendation produced by Part 1 of the Toolkit. These activities will be further refined as described later in Section 6.4.

Stakeholder consultation

The initial action lines can be tested with a small number of stakeholders to identify any considerations that may influence how the action lines are framed.

5.2 Assign outputs to action lines

Objective

This step starts by taking the strategic recommendations from Part 1 and breaking them down into a set of outputs. These outputs are assigned to one of the main action lines. Each strategic recommendation should be examined against each proposed action line, by asking what is required to implement each recommendation in terms of:

- ▶ governance outputs
- ▶ foundational outputs
- ▶ solution outputs
- ▶ change and adoption outputs.

Answering these questions requires a clear definition of the scope or focus of each action line.

If all the outputs from one strategic recommendation can be assigned to one action line, the recommendation can be assigned to that action line. Other strategic recommendations may have outputs that can be assigned to several action lines. This may be the case where change and adoption outputs are required in addition to foundational, solution and governance outputs.

Recommended outputs

This step should produce a set of outputs for each eHealth action line. Each output should be traceable back to a strategic recommendation from Part 1 (Box 1).

Box 1. Examples of strategic recommendations and outputs

Strategic recommendation: implement a unique national health identification service			
Required outputs			
Foundations	**Solutions**	**Change and adoption**	**Governance**
• National health identifiers service established. • National health identifier standards approved and published. • New national, state and regional privacy legislation introduced for introduction and use of a national health identifier service.	• Vendor community has added support for national health identifiers into most popular products and solutions. • Software compliance function established and has accredited a number of products and solutions.	• Health-care organizations and providers support the introduction of the service. • Consumers support the introduction of the service. • High priority health-care organizations and providers adopting and using accredited software.	• Operational governance and oversight mechanism for the national health identifier service established. • Appropriate funding secured for the development and operation of the national health identifiers service.

Strategic recommendation: Implement a national telehealth service for rural and remote communities			
Required outputs			
Foundations	**Solutions**	**Change and adoption**	**Governance**
• National telehealth service established. • Fit-for-purpose data connectivity established to priority communities. • Fit-for-purpose local computing and communications infrastructure established in priority communities.	• Fit-for-purpose and compliant telehealth solutions available in marketplace.	• Health worker education and training now includes telehealth training. • Community health workers able to support communities in accessing telehealth services. • Communities aware of telehealth; services widely used by priority communities.	• Operational governance and oversight mechanism for the national telehealth service established. • Appropriate funding secured for the development and operation of the national telehealth service.

Approach

This step should be an internal activity involving working sessions focused on identifying outputs for each of the strategic recommendations from Part 1, and assigning these to action lines.

In some instances the process may result in the identification of outputs that cannot be assigned to an action line. In these cases, the action lines should be reviewed to determine whether the scope of the action lines needs to be refined to accommodate the output (preferred), or whether a new action line is required.

Different stakeholders may be accountable for delivering outputs for eHealth action lines. Understanding the potential leadership and accountability for a particular output allows these stakeholders to be identified so that they can be involved in defining the required activities.

The questions below help to identify the stakeholder(s) accountable for a particular output.

- ▶ Who has the policy responsibility for this output?
- ▶ Who has the mandate or authority?
- ▶ Who has the capability and capacity to deliver the output?
- ▶ Who is perceived by the health sector and/or public as being the right entity to deliver the output?
- ▶ Who is able to engage effectively with and influence health and non-health-sector stakeholders?
- ▶ Who has access to the appropriate financial resources?

5.3   Identify the activities required to deliver the outputs

Objective

This step identifies the activities required to deliver the outputs of a particular eHealth action line. High-level activities are strategically important projects, initiatives or other actions required to deliver an output, rather than detailed activities and tasks that would typically be defined as part of planning an individual project. Activities are the basis of an action plan and should be defined as to their scope, timing and dependencies (Table 7). Defining these activities will enable resourcing and funding requirements to be determined.

Table 7. Elements defining eHealth activities

Element	Description	Role
Scope	A high-level understanding of the intent of the activity, typically defined in terms of particular outputs that the activity will need to deliver.	• Supports the identification of likely timing, dependencies, resourcing and ultimately funding requirements.
Duration	A high-level estimate of the magnitude of duration for each activity (e.g. 3 months, 6 months, 1 year, 2 year, etc.).	• Required to identify the timings associated with each activity for a particular eHealth action line, and ultimately the eHealth action plan.
Dependencies	The high-level relationships between activities that may influence the time when an activity can start and/or be completed.	• Influences the sequencing of activities, which ultimately impacts the timings for eHealth action line plans and the eHealth action plan. • The exploration of dependencies will be further discussed in a later section. However, it is likely that the identification of dependencies will start during this activity. This knowledge can be carried forward to support a more detailed exploration of dependencies within eHealth action lines.

Recommended outputs

This step should produce a description of the high-level activities for each action line, including the scope, duration and dependencies of each activity (Table 8). Annex D provides further examples of potential activities in each of the eHealth action lines.

Table 8. Sample activities in four common eHealth action lines (not exhaustive)

Action line	Sample activities
Governance	• Design and establish a national eHealth governing council • Design and establish eHealth regulatory functions • Design and establish national eHealth entity to direct and manage national eHealth investment • Formalize governance interactions with other national, regional and local governance bodies
Foundations	• Develop high-level requirements and design for foundation of eHealth service • Deploy and operate national eHealth service • Define eHealth standards development process • Review existing national and international standards • Develop and approve standards and terminologies • Agree and adopt nationally consistent regulatory framework for health information protection • Establish mechanisms to improve computing infrastructure in healthcare organizations • Deploy priority data connectivity infrastructure
Solutions	• Establish a national eHealth solutions investment fund • Foster development of high-priority eHealth solutions • Design and establish a national solutions compliance function • Develop and publish certification and compliance criteria • Develop high-level requirement and design for priority national eHealth services and applications • Select implementation partner to perform detailed design and build of national eHealth service • Deploy and operate national eHealth service or application
Change and adoption	• Identify and assess priority change and adoption targets • Develop and roll-out eHealth awareness campaigns • Establish framework for measuring effectiveness of engagement and awareness activities • Establish national eHealth knowledge repository • Develop and roll-out financial incentive regime • Roll-out financial incentive communications programme • Monitor eHealth solution adoption • Define standard eHealth competency framework • Implement education and training course changes • Design targeted stakeholder reference and working groups • Engage and consult with stakeholder reference and working groups

Approach

This step should begin as an internal activity, but it may be extended to involve participation of health and non-health-sector stakeholders who may ultimately be accountable for activities in the action plan.

Internal analysis

Initially, internal working sessions should be undertaken to identify the activities required to deliver the outputs for each eHealth action line. The identification of activities should consider the strategic recommendations from which the relevant outputs were derived; in particular, any specific activities that may have been explicitly or indirectly described by the recommendation.

Multisectoral consultation and participation

The identification and definition of activities should be a multisectoral effort, because various health and non-health stakeholders will probably be accountable for executing them. Stakeholders identified in Section 6.2 as having potential accountability for outputs of eHealth action lines should be consulted and involved in defining the activities required to deliver those outputs.

5.4 Identify additional change and adoption activities

Objective

This step identifies additional change and adoption activities required to support the outputs and activities identified for each eHealth action line.

Change and adoption activities encourage and enable health-care participants – such as consumers, health-care providers, managers and administrators – to prepare for, adopt and use the national eHealth environment as a core part of health-services delivery. Country experience indicates that this requires a national change and adoption strategy to drive the adoption of eHealth in priority areas of the health system, and to drive the broader adoption of eHealth towards a self-sustaining point.

The need for change and adoption activities should emerge as activities are identified for each action line. To ensure that the main change and adoption activities have been identified, it may be useful to explore the questions below for each activity.

- ▶ How might the activity impact stakeholders such as consumers, healthcare providers, managers and administrators?
- ▶ Do stakeholders understand the benefits of the activity for them?
- ▶ How will stakeholders understand and react to the potential impact of the activity?
- ▶ What are the risks and challenges to be overcome to ensure understanding and acceptance?
- ▶ What activities may be required to address these risks and challenges?

Answering these questions will assist in understanding the change and adoption strategy required to support the delivery of the national eHealth vision. This strategy will be articulated through the various activities that are defined within the Change and Adoption eHealth action line.

Recommended outputs

A description of the change and adoption activities required to deliver the national eHealth vision, including scope, duration and dependencies of each activity. Collectively, these activities constitute the high-level change and adoption strategy for the country. Examples of change and adoption activities are provided in Annex D.

Approach

In practice, the identification of change and adoption activities should occur as the outputs and activities of each eHealth action line are identified (Section 6.3), but is highlighted here as it is a critical part of the action plan.

5.5   Identify dependencies between activities

Objective

This step identifies the dependencies between the activities in different action lines. Dependencies affect the sequence, timing and delivery of activities in the action lines.

Identifying dependencies requires an understanding of the relationships between activities. Dependencies may arise for three main reasons:

- ▶ *Timing.* Some activities may be unable to start until others have finished; some may start earlier, but will be unable to finish until others have been completed.
- ▶ *Resources.* Available resources may constrain the number of activities that can be delivered at any one time.
- ▶ *Change.* The health system will only be able to accept a certain amount of change over a given time period, which may limit the number of activities that realistically can be delivered at any one time.

Dependencies will exist between activities in the same action line as well as activities in other action lines. This step should identify both types of dependencies, as they will inform the development of individual activity plans as well as the action plan.

Recommended outputs

This step should identify the primary dependencies between activities and the rationale for each dependency. Dependencies must be understood to a sufficient level of detail to be useful in informing the sequencing of activities in a work plan.

Approach

This step should be undertaken as an internal activity to identify the relationships between activities and other causes of dependencies, and use this to define the dependencies within and across eHealth action lines.

5.6   Develop individual plans for each action line

Objective

This step develops a high-level plan for each of the eHealth action lines. This involves using the knowledge of accountability, activities, timings and dependencies to lay out a logical plan for delivering the outputs of each action line.

Recommended outputs

This step should produce a plan for each eHealth action line that communicates the activities, their duration and timing (Figure 8).

Figure 8. Sample eHealth action line plan[1]

Outputs	Year 0	Year 3	Year 6	Year 10
Identification and Authentication	Implement UHI service	Operate UHI service		
	Implement NASH service	Operate NASH service		
Information Protection	Agree and adopt the NHIRF			
National E-Health Information Standards	Define standards development process			
	Electronic prescriptions / Event summaries & notifications / Care plans	Reporting datasets		
	Test orders/results / Medications decision support / Chronic disease management			
	Referrals / Test orders decision support / Telehealth			
	IEHR			
	Terminologies			
	Secure messaging			
		Implement and enhance standards		
		Develop new standards		
Computing Infrastructure and Core Systems	Determine State/Territory funds allocation	Establish and refresh infrastructure	Maintain infrastructure	
	Define accreditation requirements	Implement accreditation requirements		
National Broadband Services	Extend fit-for-purpose broadband services to all care providers			

The above example describes the activities within the foundations action line, along with the high-level timing and sequencing of activities. Dependencies are not explicitly shown, but they form an important input into sequencing activities. The outputs are shown at a high level along the left of the diagram.

The individual plan for an eHealth action line may be accompanied by a list of the stakeholders who may have accountability and leadership for the various activities. The information can be summarized as a table (if complex), or on a single diagram if accountability does not differ substantially across the activities.

Approach

This step should be approached as an internal activity to identify the sequencing and timing of activities, which in turn will be influenced by duration and dependencies with other activities in the same action line. The impact of dependencies between action line plans will be explored in the next stage as the individual plans are integrated.

The timeframe for action line plans should be consistent with the strategic timeframe for the national eHealth vision. A consistent timeframe will support the integration of individual action line plans into a single eHealth action plan.

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1   *National E-Health and Information Principal Committee. National E-Health Strategy, 30th September 2008.* Adelaide, Deloitte Touche Tohmatsu, 2008.

5.7   Identify risks associated with the delivery of action line plans

Objective

This step identifies the risks arising from the activities defined across the action lines. Risks focus on those aspects of the environment that reduce or limit the ability of an activity, or set of activities, to achieve a particular output (for examples, see Annex E).

Risks may exist across a number of areas including:

- ▶ leadership and governance
- ▶ stakeholder engagement and buy-in
- ▶ resources and funding
- ▶ implementation approach
- ▶ external dependencies.

Risks are an important input to the integration of the individual action line plans into a holistic action plan, which occurs in the next stage. As part of the integration, the action plan is structured and refined to mitigate risk as much as possible.

Recommended outputs

The output of this step will be a description of the risks associated with each of the individual eHealth action lines.

Approach

This step should be approached as an internal activity that will require working sessions to identify the relevant risks. Some risks may be specific to a particular activity, while others will be broader and span one or more action line.

Once risks are identified, additional analysis should be undertaken to determine how they can be mitigated. There may be multiple ways in which this can be done, including through changes to the work plans for individual action lines.

5.8   Refine eHealth action lines (optional)

Objective

This optional step refines the initial set of eHealth action lines to ensure that they accurately describe the logical areas of activity required to deliver the national eHealth vision.

Examples of the reasons why the initial set of action lines may need to be refined include:

► numerous activities that do not logically fit into one of the defined action lines

► too few outputs and activities in an action line for it to be considered an action line in its own right

► too many outputs and activities in an action line, which has resulted in it being too complex to interpret and communicate.

Whatever the reason, there are various examples of how refinement could be done, including:

► modifying the scope or intent of the initial set of action lines

► collapsing one action line and its activities into another

► creating one or more new action lines into which activities can be assigned

► splitting an existing action line into two or more, to reduce complexity.

Recommended outputs

This step will refine the initial set of eHealth action lines based upon the outputs and activities that have been identified and explored during this stage.

Approach

This step should be approached as an internal activity focused on reviewing the outputs of the previous steps and determining whether the initial set of eHealth action lines needs to be refined.

Specific reasons for the creation of action lines, such as the need for visibility of certain activities as expressed by stakeholders, should be taken into account. This may require consultation with stakeholders where refinement of those particular eHealth action lines has been identified as being required.

CHAPTER 6
Develop an integrated action plan

This stage focuses on creating an integrated eHealth action plan.

Manage the process				
Engage with stakeholders				
Develop eHealth action lines	Develop an integrated action plan	Determine high-level resource requirements	Apply funding constraints to refine plan	Define implementation phases

Objective

Once the individual plans for each eHealth action line have been developed, they can be integrated to form a holistic action plan for delivering the national eHealth vision. The integration of this plan needs to revisit alignment with the strategic priorities of the national health system, and the focus of the key stakeholders and funders.

Activities

▶ Draft action plan.

▶ Check alignment with health system and stakeholder priorities.

▶ Identify delivery risks.

▶ Refine action plan to improve alignment with strategic priorities.

Outputs

A national action plan for eHealth that has been refined to improve alignment with health system and stakeholder priorities, and reduce or mitigate identified delivery risks.

6.1 Draft action plan

Objective

This step integrates the work plans of the individual eHealth action lines into a single, consolidated national action plan for delivering the national eHealth vision. Developing this plan requires consideration of two important aspects.

▶ *Interdependencies:* activities may be dependent on activities occurring in other action lines, which may require re-scheduling activities within the plan.

▶ *Risks:* the mitigation of risks identified during the development of eHealth action lines may require changes to the scheduling of activities, or the addition of new activities, to mitigate these risks.

The above considerations may result in changes to the sequencing of activities.

Recommended outputs

This step should create an initial draft of the consolidated action plan (Figure 9) capturing:

▶ the various action lines that collectively make up the national action plan

▶ the outputs that each action line is seeking to deliver

▶ the individual activities in each action line

▶ the duration and timing of individual activities.

Dependencies do not need to be explicitly shown, as doing so may impact the readability of the work plan.

Figure 9. Sample consolidated work plan for an eHealth action plan[2]

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2 *National E-Health and Information Principal Committee. National E-Health Strategy, 30th September 2008.* Adelaide, Deloitte Touche Tohmatsu, 2008.

Approach

This step involves internal working sessions to develop an initial action plan, and may be supported by limited stakeholder consultation to validate the plan.

The development of an action plan occurs over two steps.

Step 1: Integrate eHealth action line plans. The individual eHealth action line plans are brought together and re-sequenced based upon the dependencies between activities in different action lines.

Step 2: Refine consolidated action plan to reduce risks. Refine the consolidated action plan to mitigate risks identified during the development of the individual eHealth action-line work plans.

Refining the consolidated action plan may mitigate some risks, but others will probably remain. These will need to be clearly identified and managed on an ongoing basis.

6.2   Check alignment with health system priorities and stakeholder expectations

Objective

This step explores whether the action plan aligns with the priorities of the national health system and expectations of stakeholders. Misalignment may arise due to the timing of activities and their associated outputs. An important part of this step is to ensure that the action plan achieves the right balance of developing the foundational elements of a national eHealth environment, with the delivery of tangible benefits early or fast enough to demonstrate the value of eHealth.

Countries starting out in eHealth should aim to develop an action plan that ensures the development of the foundations, infrastructure and enabling components of a national eHealth environment. The action plan will still require the delivery of eHealth services, applications and tools that demonstrate the tangible benefits of eHealth.

Countries mainstreaming the use of eHealth should focus on delivering and innovating eHealth services, applications and tools that address priorities in health care and public health. The action plan may also require further work on building foundations, infrastructure and enabling components.

Validating the alignment of the action plan to health system priorities requires reviewing Part 1 outputs of the Toolkit, specifically:

▶ strategic goals and challenges and their relative priority

▶ the expectations of decision-makers and likely funders, in particular specific outputs, and the targets and timeframe for their delivery.

The action plan should be compared to these priorities and options identified for refining the plan accordingly.

Recommended outputs

This step will produce an understanding of how well aligned the action plan is to health-system and stakeholder priorities, and identify the preferred option(s) for improving this alignment.

Approach

This step requires internal analysis supported by consultation with relevant stakeholders to explore their views on priorities for the action plan and to seek their guidance regarding the options for improving alignment with these priorities (Table 9).

Table 9. Description of steps for exploring alignment of action plan

Step	Description	Example questions to consider	Outputs
1	Review alignment with health-system priorities.	• How well aligned are the outputs of the action plan with the priorities of the health system? • How well aligned are the timing of outputs with the timeframes for meeting strategic goals and challenges?	An understanding of the alignment of the action plan with health-system priorities.
2	Review alignment with stakeholder and funder expectations.	• How well aligned are the outputs with the expectations of key stakeholders and decision-makers? • How well aligned are the outputs with the expectations of likely funders? • Does the action plan deliver tangible benefits early enough or fast enough to address the expectations of stakeholders?	An understanding of the alignment of the action plan with stakeholder and funder expectations.
3	Develop options for aligning action plan with health-system, stakeholder and funder priorities.	• What type of balance should the action plan be attempting to achieve? • What options exist for improving the alignment with health-system and stakeholder priorities? • What options exist for delivering benefits earlier or faster? • What risks does each option present?	A range of options for improving alignment with health-system and stakeholder priorities, and associated risks of each option.

4	Recommend the most appropriate option(s) for modifying the action plan to align it with health-system, stakeholder and funder priorities.	• What option(s) are most acceptable to key stakeholders and decision-makers, in terms of balancing:
		  - achieving health-system and stakeholder priorities
		  - increasing delivery complexity and risk?
			The preferred option for refining the action plan.

Consultation with stakeholders (including potential funders) will reconfirm stakeholder expectations and assess options for refining the action plan to improve alignment. Consultation plays an important role in gaining the involvement of stakeholders in the development of the action plan, thus beginning the process of building their understanding of and support for the plan.

6.3 Identify delivery risks

Objective

This step focuses on identifying delivery risks at level of the the action plan. This differs from the risks for individual eHealth action lines because this step is focused on risks that exist at the programme level.

The sample questions below can be used to explore potential delivery risks.

- ▶ What is the scale of activity required?
- ▶ Is this scale too ambitious to be achieved within the required timeframe?
- ▶ Do the health sector and other supporting partners and sectors have the capacity to accept and support this activity and the associated level of change it will require?
- ▶ Does the country have the financial, human and other resources to support the delivery of the plan?
- ▶ Does the plan account for the time it will probably take to develop support and momentum for eHealth in the health sector and broader public?
- ▶ Have all the key dependencies between activities been identified and reflected in the sequencing?
- ▶ Do health and non-health stakeholders think that the action plan is achievable?
- ▶ Are there any particular activities that would be completely stop implementation of the action plan should they be delayed, or could not be delivered?

Recommended outputs

This step should identify delivery risks for the action plan, and options that may exist for mitigating or reducing their likelihood or impact.

Approach

This step should be approached as an internal activity and supported with input from relevant health and non-health stakeholders that have been involved in the development of the action plan.

Internal analysis

Initially internal working sessions should be undertaken to identify potential risks associated with the action plan. Sessions should explore the action plan from different perspectives (such as those in the sample questions above in the Objectives section).

Multisectoral input

Health and non-health stakeholders should be consulted to gain their input regarding the achievability and risks of the action plan. Stakeholders may have specific knowledge or experience with previous programmes and projects that allows them to provide constructive feedback.

6.4 Refine action plan to improve alignment with strategic priorities

Objective

This step refines the action plan based upon the changes already identified.

Refinement will probably involve one of the following actions.

- ▶ *Re-sequencing of activities.* The sequencing and timing of activities are altered to ensure that the outputs of the plan more closely align with the health system and stakeholder priorities.

- ▶ *Refining scope of activity.* The scope of activities may be refined to provide greater focus on a particular priority (e.g. on a particular health-sector segment or geographical location).

- ▶ *Re-visiting activity durations.* The duration of one or more activities is altered so that the outputs of those and subsequent activities more closely align with the health system and stakeholder priorities. Often these changes are associated with refining the scope of a particular activity.

- ▶ *Adding or removing activities.* New activities may be required to provide greater emphasis on particular priorities. Alternatively, activities may be removed if they are deemed not relevant to addressing priorities.

- ▶ *Refining an outcome approach.* It may also be necessary to consider a completely different approach to achieving a particular output for an eHealth action line. This approach may require a different set of activities to be undertaken.

Recommended outputs

The output of this step will be a refined action plan, which achieves a better balance between health-system and stakeholder priorities and the long-term development of the national eHealth environment.

Approach

This step should be approached as an internal activity focused on modifying the action plan in line with the preferred option(s) that were agreed with stakeholders.

CHAPTER 7

Determine high-level resource requirements

This stage focuses on determining, at a high-level, the resources that will be required to deliver the eHealth action plan.

Manage the process				
Engage with stakeholders				
Develop eHealth action lines	Develop an integrated action plan	Determine high-level resource requirements	Apply funding constraints to refine plan	Define implementation phases

Objective

Once an action plan has been developed, the focus shifts to understanding the skills and expertise required to deliver it. Assessing these against the country's current skills and expertise allows potential constraints to be identified, which will have implications for the approach adopted to obtaining the skills and resources required. With this understanding formed, it also becomes possible to explore the magnitude of funding required to deliver the action plan.

Activities

▶ Identify the skills and expertise required to deliver the action plan.

▶ Identify national skill and expertise constraints.

▶ Determine the approach to securing the required skills and expertise.

▶ Estimate the magnitude of funding required to deliver the action plan.

Outputs

This stage will determine the resource requirements for delivering the action plan and the approach to securing them. Based on this, this stage will also estimate the magnitude of funding required to deliver the action plan.

7.1 Identify the skills and expertise required

Objective

This step focuses on identifying and describing the skills and expertise required to deliver the action plan. This understanding forms the basis for assessing whether a country has the appropriate skills and expertise and, if not, how these might be obtained (Table 10).

Table 10. Suggested dimensions to explore skills and expertise

Dimension	Description	Example considerations (not exhaustive)
Type of resource	The skills, expertise and knowledge to undertake the activities described in the action plan.	• Clinical work practice transformation • Programme and project management • Financial modelling • Legislative and policy development • eHealth product and solution development • Enterprise and solution architecture • Privacy and data protection • Information standards development • Product and solution compliance • Change management • Communication planning and delivery • Governance model development and delivery
Resource capacity	The scale of resources that will be required to undertake the activities described in the action plan.	• Resource estimates (e.g. head-count) • Likelihood of a resource being able to fulfil multiple resource types (i.e. provide multiple required skills and expertise)
Resource distribution	The level or location where resources will be required.	• National • State • Regional • Local

Recommended outputs

This step should provide a consolidated view of the skills and expertise needed to deliver the action plan. While this understanding will be developed through assessing the requirements for delivering individual activities, the output of this step should seek to roll this up to a high-level set of resource requirements that describe the skills and expertise, capacity and distribution.

Approach

This step should initially be approached as an internal activity. However, it may need input from subject matter experts.

Internal analysis

This step will involve assessing each of the activities within the action plan to identify the requirements for each the dimensions described above in Table 10. Knowledge of domestic and international eHealth programmes and projects can be utilized during this step to assist in identifying the required skills and expertise, and in providing guidance as to the magnitude of resources that may be needed.

The focus should be on identifying at a high level the resources required, rather than determining project resource at a micro-level. Detailed resource planning will occur later as part of the activities that are described within the action plan.

Input from experts

Subject-matter experts bring specific knowledge of the skills and expertise as well as the scale of resources that may be required. Experts have specific knowledge of a particular domain (e.g. legislation), or have experience in the delivery of national or international eHealth programmes or projects.

7.2   Identify national skill and expertise constraints

Objective

This step focuses on identifying what constraints exist to fulfilling the skills and expertise requirements for implementing the action plan. Each country will have a different portfolio of skills and expertise available, affecting how well positioned it is to deliver its action plan. It is important that this portfolio of skills and expertise be explored so that gaps or constraints can be identified and resolved.

- ▶ Does the country have personnel with the required skills and expertise?
- ▶ Does the country have sufficient levels of resources with these required skills and expertise?
- ▶ Are personnel located where they will be needed, or can they be easily deployed to the required locations?
- ▶ Are there any current or planned national or international programmes or projects that may generate competition for these personnel?

Exploring questions such as these involves considering the broader resource pool from which a country can draw. The required skills and expertise may exist in the public and private sector, as well as in the broader health and non-health sectors.

Recommended outputs

This step should document the skill and expertise constraints that will affect the delivery of the action plan at the consolidated level, rather than the activity level.

Approach

This step should initially be approached as an internal activity and may require input from subject matter experts.

Internal analysis

This step will involve assessing the country's ability to fulfil the requirements identified in Section 7.1. This assessment should explore each of the dimensions and consider potential competition for resources from other domestic and international projects, and how this may impact the available resources for delivering the action plan.

The constraints identified also need to be understood in terms of their implications. This will assist in identifying the high-priority constraints that need to be resolved.

Input from experts

Experts can bring specific knowledge to this area. Examples of experts include representatives of organizations and agencies responsible for collecting and reporting on workforce statistics. These may include government bodies responsible for statistics, as well as industry and sector representative bodies.

7.3　Determine the approach to securing the required skills and expertise

Objective

Selecting the approach means giving consideration to the required skills and expertise, and the constraints in securing them (Table 11).

Table 11. Approaches to securing skills and expertise

Approach	Description	Examples
Recruit	They are directly recruited from the marketplace.	• Direct employment or hire
Contract	They are contracted from third-party providers or organizations.	• Professional services firms • Technology vendors
Partner	They are available through relationships with other public and private organizations and groups.	• Alliances • Partnerships, including public-private partnerships • Sectoral relationships
Develop	They are developed internally.	• Education and training programmes

These options can be considered from a domestic and international perspective. For example, a country may obtain skills and expertise either locally or internationally.

A country will probably need a combination of the above approaches. Some skills and expertise may be available through partnering with other organizations, while others will need to be contracted from a third-party provider or organization.

Recommended outputs

This step will describe the high-level approach to accessing the skills and expertise required to deliver the action plan. As per the previous steps, the approach should be described at the consolidated level, rather than the activity level.

Approach

This step should initially be approached as an internal activity and may require input from subject matter experts.

Internal analysis

This step explores options to securing the required skills and expertise (Table 12).

Table 12. Suggested dimensions for determining the approach to securing skills and resources

Dimension	Description	Example considerations
Constraints	The constraints that were identified for the particular skills and expertise in question.	• If no constraint is identified for a particular skill and expertise then determining the approach is likely to be a simple decision. • If a constraint has been identified then the remaining considerations will need to be explored in determining the appropriate approach.
Timing	When the country needs the skills and expertise to be available.	• If skills and expertise are required immediately or in the short-term, the country may need to consider sourcing these from a third-party provider organization. • If they are required in the medium or long term, the country may be able to consider developing its local workforce to provide these at the appropriate time.
Duration	How long the country needs the skills and expertise to be present.	• If skills and expertise are required only for a short period, it may be more appropriate to engage these from a third-party provider organization or through partnerships and alliances. • If they are required for a sustained period, it may be more appropriate to consider the development of a local workforce.
Government policy	Existing policies related to workforce development and procurement of skills, expertise and services.	• Some government policy may prohibit certain approaches to accessing skills and resources, particularly as it relates to the health sector and management of health information. • Some government policy may provide direction regarding the skills and expertise that need to be developed locally. This may influence the selection of how skills and expertise are secured for delivering an eHealth action plan.
Availability	Availability of the required skills and expertise in the marketplace.	• If the required skills and expertise are simply not available from third-party provider organizations, or through partnerships, the country may need to develop these capabilities itself.
Ownership	Who owns the required skills and expertise.	• The skills and expertise required may exist in the local workforce but may be owned largely by third-party providers. In this case, the pragmatic approach would be to engage these providers.

Input from experts

This step may benefit from input from experts who understand the policy, availability and ownership dimensions described above. It may also be necessary to engage with potential partners, provider organizations and the broader marketplace to assess what skills and expertise are available.

Some countries may engage an external organization that specializes in sourcing strategy to undertake this step, particularly if it is likely that a country may need to access skills and expertise from the international marketplace.

7.4 Estimate the magnitude of funding required to deliver the action plan

Objective

This step estimates the magnitude of funding required to deliver the action plan for eHealth. The funding will be influenced by various factors including:

- the scale and type of resources required
- the approach to securing skills and expertise
- capital and operational expenditure related to information and communications technology (ICT) infrastructure
- funding required by change and adoption mechanisms, such as financial incentive programmes for healthcare providers and solution investment funds.

This step should not be focused on performing a detailed financial costing exercise, but rather on estimating the magnitude of funding. It requires an understanding of the above factors and other domestic and international eHealth programmes and their associated funding levels.

Recommended outputs

This step should produce an estimate of the range of funding required to deliver:

- each activity within the action plan
- all activities within a particular eHealth action line
- the entire eHealth action plan.

Some countries may have additional requirements on the information that needs to be produced as part of this step. Country experience suggests that other common requirements include being able to:

- distinguish between incremental funding and total funding, which may be required when the action plan incorporates programmes and projects that already have funding;
- describe the cash flow for the action plan, as this provides visibility of how the required funding varies over time.

Approach

There are various approaches to estimating funding requirements. This can be done through a combination of 'bottom up' and 'top down' estimation techniques (Figure 10).

Figure 10. Suggested approach to estimating funding requirements
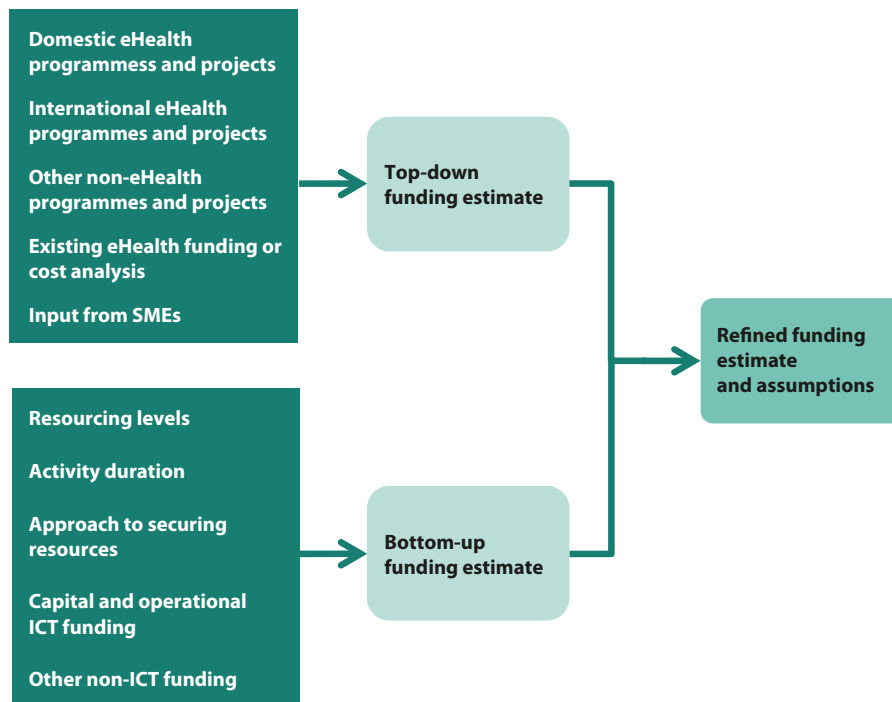
Top-down estimation is also known as experience-based estimation, as it uses information regarding the funding of relevant programmes and projects to estimate funding. Funding data from these are adjusted to account for differences with the action plan (e.g. differences in scale, duration, etc.). Top-down estimation can be done at various levels, including activity, eHealth action line or at the action plan level.

Examples of inputs to a top-down estimation approach may include knowledge related to:

- ▶ funding for domestic eHealth programmes and projects;
- ▶ funding for international eHealth programmes and projects;
- ▶ funding for other non-eHealth programmes and projects that have similar characteristics or attributes to activities in the action plan;
- ▶ pre-existing financial or cost modelling undertaken for eHealth programmes and projects;
- ▶ input from experts on large-scale eHealth programmes and projects.

Bottom-up estimation involves estimating costs based on identifying the particular cost-drivers for each activity in the action plan. For this reason, it can be significantly more time-consuming.

Examples of inputs to a bottom-up estimation approach include:

- ▶ the estimated resources required to deliver a particular activity;
- ▶ the estimated duration of a particular activity;
- ▶ the proposed approach for securing skills and expertise, as this will influence the cost of accessing the appropriate resources;
- ▶ estimates of capital and operational funding for ICT infrastructure that are being delivered by a particular activity, which may require input from eHealth/ICT vendors and other experts;
- ▶ additional funding associated with a particular activity, such as incentives and funding programmes that form part of the approach to change and adoption.

Top-down and bottom-up estimates can be used together to refine the total funding estimate for the programme.

A funding range (i.e. a minimum and maximum) should be specified during this step. Using a range makes it clear that the funding estimate has a degree of uncertainty, and avoids misperceptions that an exact funding figure has been achieved. Any important assumptions that underpin the estimate should also be clearly described to ensure that decision-makers have the full context.

CHAPTER 8
Apply funding constraints to refine plan

This stage focuses on refining the action plan based on the country's funding constraints.

Manage the process				
Engage with stakeholders				
Develop eHealth action lines	Develop an integrated action plan	Determine high-level resource requirements	Apply funding constraints to refine plan	Define implementation phases

Objective

This stage will assess the financial resources available to implement the proposed action plan, from a magnitude and timing perspective. This knowledge will be used to refine the action plan so that it is realistic, pragmatic and implementable.

Activities

▶ Determine the potential availability of funding.

▶ Agree how to refine the action plan to account for funding availability.

▶ Refine the action plan.

▶ Revise the national eHealth vision to reflect changes arising from the availability of funding.

Outputs

A refined action plan that takes the availability of funding into account. The implications for the national eHealth vision that arise from the refined plan will also be identified and documented.

8.1 Determine the potential availability of funding

Objective

This step assesses the magnitude of funding that will be available to implement the action plan from the standpoint of the broader funding environment, to determine if there are additional potential funding sources available (Table 13).

Table 13. Exploring the potential availability of funding

Considerations	Description	Examples
Funding sources	The organizations and agencies that are potential sources of funding for the action plan.	• Federal government departments and agencies • State government departments and agencies • Regional governments and agencies • Nongovernmental organizations (NGOs) • International development agencies • International or regional development banks • Existing funding and incentive schemes • Vendors and industry (health and non-health)
Funding mechanisms	The potential mechanisms through which funding can be obtained from funding sources.	• Direct funding allocation • Donation • Loan • Public-private partnerships (PPPs)
Magnitude	Estimate of the magnitude of funding that each potential funding source could provide.	• High-level funding range, rather than specific funding amounts
Timing and duration	Understanding of the timing when potential sources of funding may be available, and over what duration funding may be accessible.	• Short-term • Medium-term • Long-term
Conditions	Understanding any conditions that may be required to secure funding from potential funding sources.	• Population health outcomes • National infrastructure development • Health system improvement • Clinical and medical research improvement

Annex F contains further information on public-private partnerships (PPPs) as a potential funding mechanism.

Recommended outputs

This step should identify the potential funding sources and magnitude of funding that could be available to support the action plan. It is not the objective of this step to formalize agreements to secure this funding.

Approach

The approach to this step depends on whether a country is seeking to develop an understanding of the broader funding that may be available to deliver its action plan.

Internal analysis

The extent of internal analysis will depend on a country's interest in identifying broader sources of funding that could be available for the action plan. This should involve research and analysis of funding sources such as those in Table 13. It may also be useful to research how other countries have funded national eHealth programmes and projects, in order to identify any innovative approaches to funding that may be relevant.

Input from decision-makers

This step requires dialogue with the appropriate decision-makers to gain clarity on the magnitude of potential funding that will be made available. Country experience suggests this should involve national health sector and other government decision-makers as primary funders of national eHealth programmes. The intention of these discussions is not necessarily to agree a specific funding level, but rather to gain an understanding of the likely range of funding possible.

Some countries have found when undertaking this step that decision-makers have opted not to identify a likely magnitude of funding. This may be the case where decision-makers do not want to constrain the action plan from a financial perspective, but rather to publish the full financial requirements of delivering a national eHealth vision.

Discussions with potential funding sources

Countries exploring broader avenues of funding may also initiate discussions with other sources. Here, the aim is not to formalize funding agreements, but rather to determine the likelihood of funding for eHealth and to take account of other funding-related aspects such as timing, duration and other conditions.

For example, discussions with an international development agency may highlight that there is a potential opportunity to obtain funding for eHealth, but that this needs to be linked to improvement of population health outcomes, such as improving the delivery of basic health-care services to remote communities. Whether or not this presents a funding opportunity will depend on whether there are activities within the action plan that fit this requirement.

8.2 Agree on options to refine action plan

Objective

This step determines how the action plan will be refined to take into account the magnitude of funding that will be available to support its delivery. Refinement will be necessary when the expected funding falls short of the identified requirements. Country experience suggests that refinement is typically undertaken because countries have competing demands for financial resources, which results in only a portion of the required funding being made available in the required timeframe.

This step requires identification of various options for refining the action plan so that it can be delivered with the funding that will probably be made available. These options will require trade-offs regarding what, where and when eHealth components are delivered, which in turn will have implications for which health system goals and challenges are addressed by eHealth. The selection of the appropriate options will require input from the relevant decision-makers and stakeholders.

Recommended outputs

This stage will identify an agreed set of changes to the action plan that will enable it to be delivered with the funding that will likely be available.

Approach

This step will require a combination of internal analysis and consultation with decision-makers to agree how the action plan will be refined based on availability of funds (Table 14).

Table 14. Approach to refining action plan to take account of funding availability

Step	Description	Examples of questions to consider	Outputs
1	**Identify the various options for refining the action plan so that it can be delivered within the funding that will likely be available.**	• How could activities be re-sequenced to support funding timing and duration? • How could the scope of activities be refined to support the likely magnitude of funding, and the timing and duration of that funding? • How could the scope of activities be refined to meeting conditions of funding? • Can the duration of activities be refined to support the likely magnitude of funding, and the timing and duration of that funding? • What activities could be considered being removed to support the likely magnitude of funding? • Is there a different approach to delivering the outputs of a particular activity, or set of activities, that better supports the likely magnitude of funding, and the timing and duration of that funding?	A number of options that describe how the action plan could be modified to take account of potential funding availability. Typically, each option would describe a set of potential changes to activities, which collectively meet the likely funding availability. Section 8.3 suggests various approaches to modifying activities, which could be used to develop options during this step.
2	**Understand the impact of each option on achieving the required health system goals and challenges.**	• What is the impact on achieving the strategic recommendations of the national eHealth vision? • What is the impact on establishing the required eHealth components? • What is the impact on achieving the vision for eHealth? • What is the impact on addressing health system goals and challenges? • What is the impact on broader national and multisectoral development goals?	A description of the impact of each option on the national eHealth vision and the health system goals and challenges that this vision was developed to address.
3	**Jointly evaluate each option with relevant decision-makers and stakeholders and select a preferred option for refining the action plan.**	• Which option provides the greatest value in terms of addressing health system goals, challenges and priorities? • Which option is likely to deliver outputs and results that will promote further investment in the nation's eHealth environment? • What outputs and results are mandatory, as opposed to those that could be considered important or desirable?	The preferred option for refining the action plan given the likely funding that will be available; or request to refine one or more options so that these can be explored; or recognition that additional funding will be needed to deliver the required outputs and results.

The above approach may need to be undertaken in an iterative fashion. The evaluation of options must be undertaken with the primary decision-makers of the national eHealth vision, as this is likely to require consideration of trade-offs (i.e. benefits versus costs). Other stakeholders may be consulted to support the identification of options, and the assessment of their impact on the national eHealth vision and associated health system goals and challenges.

8.3   Refine action plan

Objective

This step refines the action plan based on the preferred option selected above.

Recommended outputs

The output of this step will be the refined national eHealth action plan which can be realistically delivered within the likely funding that will be available.

Approach

This step should be approached as an internal activity focused on updating the action plan by changing various activities to reflect the preferred option, such as:

- ▶ re-sequencing of activities
- ▶ refining the scope of activities
- ▶ revising the duration of the activities
- ▶ removing activities
- ▶ applying a different approach to achieving a particular outcome of the action plan, which will involve changing the activities within it.

8.4   Revise national eHealth vision to reflect changes arising from the availability of funding

Objective

This step revises the national eHealth vision developed during Part 1 of the Toolkit to reflect the changes arising from the availability of funding. At this point a decision has been made regarding which activities will and will not be undertaken given the funding that is likely to be available. This will have an impact on the national eHealth vision, and ultimately the health system goals and challenges that the vision was developed to support.

The understanding required to undertake this step will have been developed through undertaking the activities described in Section 8.2, which explored the impact of each option on the national eHealth vision and associated health system goals and challenges.

Recommended outputs

The output of this step will be an updated national eHealth vision, which reflects the realities of the nation's probable funding for eHealth.

Approach

This step should be approached as an internal activity focused on updating the national eHealth vision to reflect the preferred option selected during Section 9.2. This step should utilise the knowledge developed during the Assess impact of options step described in Section 8.2.

CHAPTER 9
Define implementation phases

This stage focuses on defining the various phases for delivering the nation's eHealth vision.

Manage the process				
Engage with stakeholders				
Develop eHealth action lines	Develop an integrated action plan	Determine high-level resource requirements	Apply funding constraints to refine plan	Define implementation phases

Objective

This stage defines implementation phases which can be used to communicate the often complex content of the action plan for eHealth in a manner that can easily be grasped. Targets for the development and use of eHealth can also be defined for each phase.

Activities

▶ Identify the logical implementation phases.

▶ Define the stakeholder communication messages for each phase.

▶ Describe the targets for each phase.

Outputs

A set of implementation phases, associated targets and communication messages for the action plan.

9.1 Identify the logical implementation phases

Objective

This step focuses on identifying the logical phases of implementation activity in the action plan. An implementation phase describes the strategic focus during particular period of time (Figure 11).

Figure 11. Implementation phases in an eHealth action plan
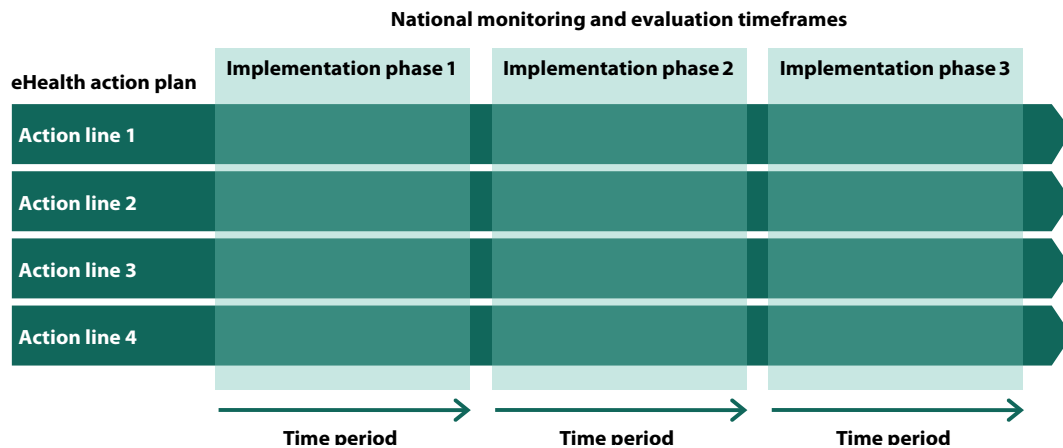
Recommended outputs

This step will identify three to four implementation phases, including the strategic focus and time period of each phase.

Approach

This step requires internal analysis to identify three to four implementation phases for the action plan. Country experience suggests that decision-makers and stakeholders find this easier to understand, manage and fund (Table 15).

Table 15. Approach to identifying implementation phases

Step	Description	Examples of questions to consider	Outputs

1	Divide the action plan into three or four time periods.	• What is a sensible set of timeframes to break up the action plan into three or four phases? For example:
		  – a 10-year plan could be split into three time periods of 0–3 years, 3–6 years, and 6–10 years;
		  – a 5-year plan could be split into three periods of 0-18 months, 18–36 months and 36 months to 5 years.
			An action plan that has been split into three or four time phases.

2	Analyse the strategic focus within each of these time periods.	• What are the various activities in each of the phases? • What are these activities collectively attempting to accomplish in terms of the eHealth environment? • Which themes can be used to communicate what this phase will deliver?	An understanding of the strategic focus of each implementation phase.
3	Refine time periods based on the identified strategic focus.	• Are there other activities outside an implementation phase whose intent or focus matches the strategic focus of that implementation phase? • How might the timing of an implementation phase be refined to capture these additional activities, while avoiding overlap of phases? • Are there any external timing requirements that may influence the timing of implementation phases, such as political (re-election), and external or donor funding cycle?	Finalized set of implementation phases.

9.2   Define stakeholder communication messages for each phase

Objective

This step defines the communication message for each implementation phase. These messages describe the strategic focus of each implementation phase to decision-makers and other important stakeholders and should be based on the theme or purpose of the various activities within an implementation phase. These include:

▶ the tangible outputs or changes that an implementation phase will deliver;

▶ the progress towards the national eHealth vision that an implementation phase will achieve;

▶ specific expectations of decision-makers and stakeholders regarding particular aspects of the country's eHealth programme that need to be drawn out.

Recommended outputs

This step will produce a set of stakeholder communication messages for each implementation phase, which describe the strategic focus or intent of that phase (Box 2).

Box 2. Example of messages for implementation phases[3]

Given the long time over which eHealth will need to be delivered and the realities of the three-to-four year political cycles in some countries, breaking the journey down into 3, 6, and 10 year planning horizons will provide the programme with an ability to remain focused by delivering incremental and tangible blocks of capability.

These planning horizons are focused on achieving three progressive states of maturity in information sharing:

• **Connect and communicate** – in which the focus is on establishing the foundations for eHealth and providing basic connections that allow information sharing to occur between care providers and across the health sector.

• **Collaborate** – in which the focus shifts from basic communication to collaboration, joint care planning and multi-disciplinary care delivery through more extended information sharing.

• **Consolidate** – in which eHealth becomes part of business-as-usual for health-care provision. In this stage there is a focus on maintaining and enhancing a sustainable health information-sharing environment that supports ongoing innovation and the development of future models of care based on rich and extensive information sharing.

Approach

This step should be approached as an internal activity, potentially with consultation with select stakeholders to test and refine the communication messages.

Internal activity

Initially the focus should be on developing a set of stakeholder communication messages for each of the implementation phases. It is expected that the analysis and knowledge developed during Section 9.1 will be an input to the development of these messages. The messages should not be overly lengthy or complicated, but instead be concise and tailored to the intended audience.

Stakeholder consultation

There may be value in informally testing the initial set of messages with a small group of stakeholders. This may assist in identifying concepts, language or other aspects that need to be further refined before being communicated to the broader stakeholder environment.

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3   *National E-Health and Information Principal Committee. National E-Health Strategy, 30th September 2008.* Adelaide, Deloitte Touche Tohmatsu, 2008.

9.3   Describe the targets for each implementation phase

Objective

This step describes the targets for eHealth development and adoption that each implementation phase will deliver. The targets are described in terms of the improvements that important stakeholder groups, such as those for which the national eHealth vision was described in Part 1 of this Toolkit, will experience as they interact with the health system.

Recommended outputs

This step will produce a set of implementation targets for each phase, articulated in terms of the improvements that important stakeholder groups will experience (Box 3).

Box 3. Implementation targets for the Connect and Communicate phase (Years 1–3)[4]

Consumers
- Consumers will begin to be able to be uniquely identified by the health sector through the roll-out and initial adoption of the Unique Health Identifiers.
- The national Consumer Health Portal has been implemented and consumers are beginning to use this as one of their primary online sources of health information to assist in management of their health care.
- Twenty per cent of consumers of access to a limited form of electronic health record and two to five per cent of consumers begin to access personal health information from initially available IEHR solutions.

Care Providers
- Broadband connectivity available to the majority of care providers; organizations are investing in new infrastructure.
- Care provider adoption of eHealth is increasing with key care-provider segments becoming more computerised (95+% of GPs, 60+% of specialists, 95+% of pharmacists and 95+% of pathologists/radiologists).
- Increasing numbers of care providers are adopting and utilising eHealth standards-compliant systems that support electronic transfer of prescriptions and electronic test orders/results (50% of GPs, 20% of specialists, 70% of pharmacists and 70% of pathologists/radiologists).

Healthcare Managers
- Healthcare managers are gaining increasing awareness and understanding of the benefits of eHealth and the potential for improved reporting and research datasets.
- Small amounts of improved reporting data, primarily relating to prescriptions and test ordering is starting to become available to healthcare managers for analysis.
- Healthcare managers, particularly those in target segments are investing funds in IT infrastructure to provide base computing and systems capability which will support eHealth.

Vendors
- Funding available to provide incentives for the development of high priority, standards compliant eHealth solutions.
- Vendors see the emergence of clearly defined national eHealth standards and can rely on these standards when enhancing existing, or developing new solutions.
- Vendors are engaged around the eHealth software compliance process and timelines have been agreed for high-priority solution compliance.

Background Activities
- A consistent privacy and information protection regime has been agreed and implemented across the country.
- Standards for electronic prescriptions, test orders/results, IEHR, care plans and telehealth have also been defined and are being used as the basis for solutions by vendors.
- A national eHealth entity has been established with responsibility for developing and maintaining the national eHealth strategy, sourcing and managing eHealth investment, managing the delivery of national eHealth infrastructure components, encouraging the development and use of high-priority eHealth solutions, testing eHealth solution compliance with defined standards and regulations, and designing and overseeing national stakeholder adoption, incentive, change and training programmes.

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4   *National E-Health and Information Principal Committee. National E-Health Strategy, 30th September 2008.* Adelaide, Deloitte Touche Tohmatsu, 2008.

Approach

This step is an internal activity focusing on defining the targets for each implementation phase. This will require an analysis of the activities within each implementation phase to determine:

- ▶ What each activity or set of activities will have delivered by the completion of an implementation phase;
- ▶ What impact the activity or set of activities has had on important stakeholder groups in terms of improving their interaction with the health system.

ANNEX A
Structure of an eHealth action plan

This Annex outlines a suggested structure and list of contents for a national action plan for eHealth. This is the document that all stakeholders and other interested parties will be invited to read in order to understand and begin to implement the country's action plan. As stated at the beginning of Part 2, elements of the action plan are unavoidably and of necessity complex. Nevertheless, efforts to make it accessible and understandable to a wide audience are worthwhile. This approach not only benefits the immediate readership, but also those for whom the plan and its main elements should be championed and communicated, including the general public.

The running order of the sections should be modified according to the intended audience. For example, some audiences may find it easier to understand the eHealth action lines, and associated outputs and activities, before describing the implementation horizons, while others may find the suggested structure more logical. However, regardless of the audience, it is recommended that each of the sections highlighted below be addressed and contained in the national eHealth action plan (Box 4).

Box 4. National eHealth action plan

Title

Foreword

Purpose

Audience

How to read this document

 Executive summary

1. Overview

    1.1   High-level overview of the action plan

    1.2   Implementation phases

    1.3   Strategic focus of each phase

    1.4   Targets for each phase

2. Action plan

    2.1   *(One section per eHealth action line)*

        2.1.1   Expected outputs, linked to strategic recommendations

        2.1.2   Main (high-level) activities, their dependencies and risks

        2.1.3   Leadership and accountability

    2.2   Delivering the action plan

        2.2.1   High-level resource requirements

        2.2.2   Approach to securing skills and expertise

        2.2.3   Implementation timeline

Annex A. List of stakeholder consultations

Annex B. References

ANNEX B
Methodology summary

This Annex summarizes the methodology described in Part 2. This is intended to help users of this Toolkit to organize and manage the development of an action plan for eHealth.

Table 16. Methodology summary for developing a national eHealth plan

Stage	Activities	Outputs
Manage the process	• Maintain the health leadership and support established in Part 1 • Review and adjust governance mechanisms as needed • Ensure the required skills and expertise are present • Determine the timeline for developing the action plan	The timely delivery of an action plan for implementing the national eHealth vision.
Engage with stakeholders	• Clarify the role of government in developing the action plan • Identify the stakeholders that may need to be involved • Identify the stakeholder roles • Plan the approach to engaging with stakeholders • Define where stakeholder consultation will occur	A pragmatic action plan for eHealth that is broadly accepted and supported by stakeholders.
Develop eHealth action lines	• Define main action lines • Assign outputs to action lines • Identify the activities required to deliver the outputs of each action line • Identify change and adoption activities • Identify dependencies between activities • Develop individual action plans for each action line • Identify risks associated with the delivery of action line plans • Refine eHealth action lines (optional)	An indicative plan for each eHealth action line, which communicates the outputs, activities, dependencies, timings and risks.
Develop an integrated action plan	• Draft action plan • Check alignment with health system priorities and stakeholder expectations • Identify delivery risks • Refine action plan to improve alignment with strategic priorities	A national action plan for eHealth that has been refined to improve alignment with health system and stakeholder priorities, and reduce or mitigate delivery risks.
Determine high-level resource requirements	• Identify the skills and expertise required to deliver the plan • Identify national skill and expertise constraints • Determine the approach to securing the required skills and expertise • Estimate the magnitude of funding required to deliver the action plan	• Assessment of resources required, and national constraints to access them. • Proposed approach to securing required skills and resources taking into account national constraints. • Estimate of the magnitude of funding required to deliver the action plan.
Apply funding constraints to refine the plan	• Determine the potential availability of funding • Agree on options to refine the action plan • Refine the action plan • Revise the national eHealth vision to reflect changes arising from the availability of funding	• Refined action plan that takes into account the availability of funding. • Documented implications for the national eHealth vision that arise from the refined plan.
Determine implementation phases	• Identify the logical implementation phases • Define the stakeholder communication for each phase • Describe the targets for each implementation phase	• Recommended implementation phases for the action plan. • Implementation targets for each phase.

Annex C
Mapping eHealth components to action lines

This Annex shows how the eHealth action lines introduced in Chapter 5 relate to the national eHealth component map provided in Part 1 of the Toolkit. The component map has been split across two pages for readability (Figure 12).

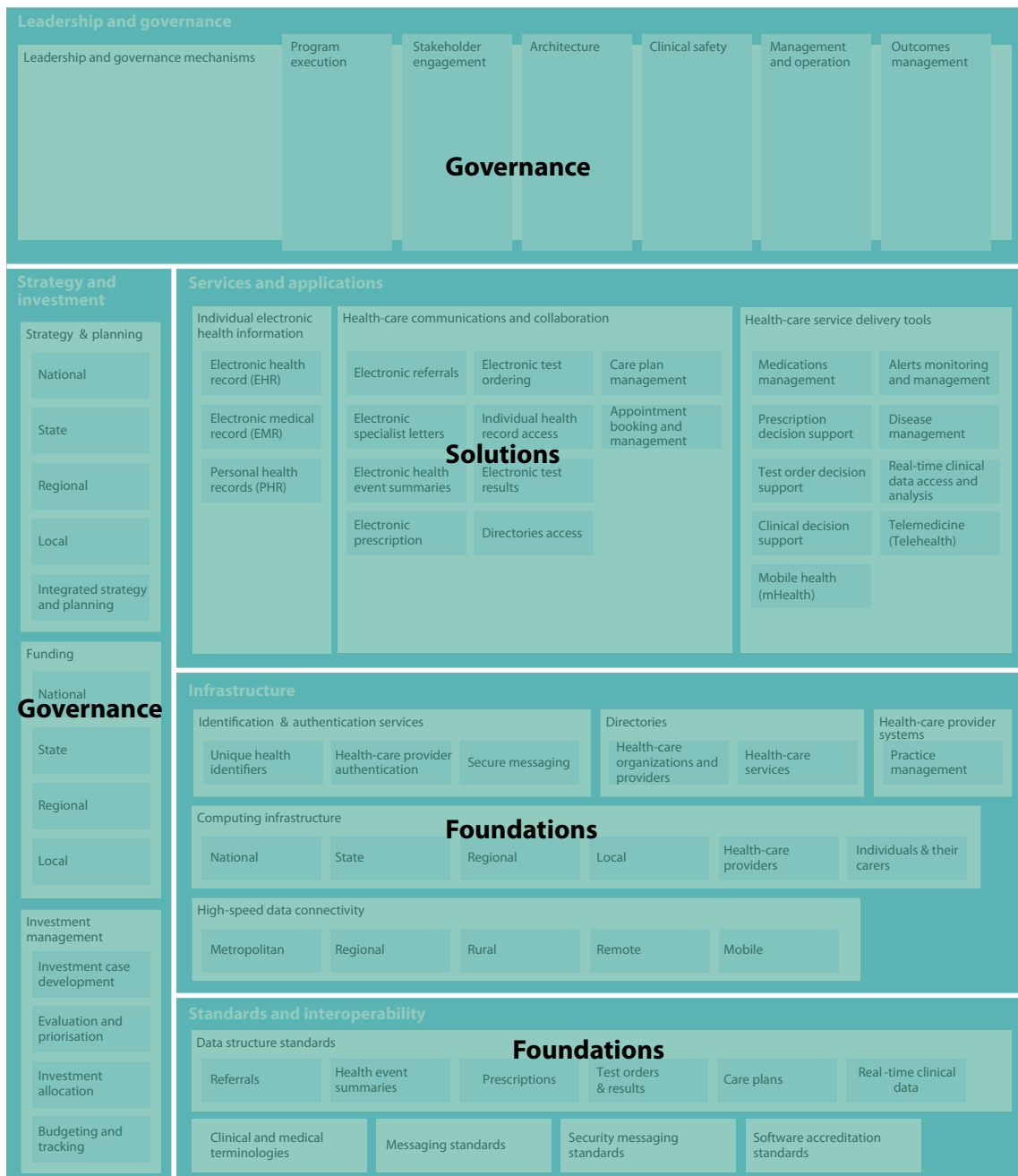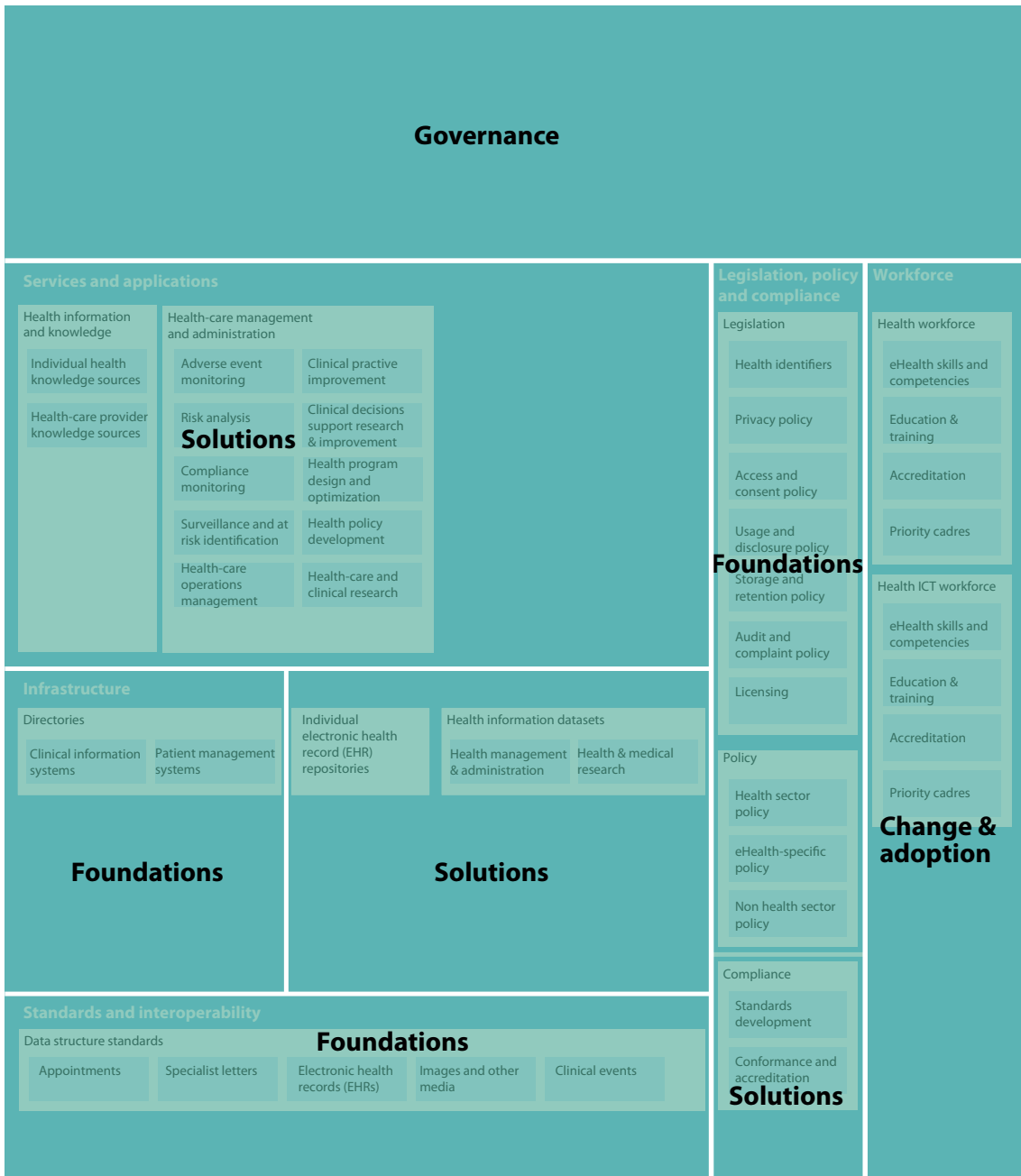**Figure 12. Mapping eHealth components to action lines**

Figure 12. Mapping eHealth components to action lines

ANNEX D
Examples of eHealth activities

This Annex provides additional information about potential activities that may fall within each of the four common eHealth action lines. This is not intended to be an exhaustive list of activities from which countries should select, but to assist readers in understanding the appropriate level and types of activities they should be attempting to identify and describe. The activities that a country will need to pursue will be driven by their eHealth vision and implementation approach.

Governance activities

These activities focus on those components that provide coordination, visibility and oversight for eHealth implementation. These are the components that will manage the delivery of the action plan, and govern the broader development of the eHealth environment. These activities often focus on establishing governance structures and mechanisms for accountability, transparency and leadership of a national eHealth programme (Table 17).

Table 17. Examples of governance activities (not exhaustive)

Example activities	Description
Design and establish a national eHealth governing council	Focuses on the design and establishment of a board or council that has accountability for setting overall national eHealth direction and priorities, for reviewing and approving national eHealth strategy and funding decisions, and for monitoring of national eHealth strategy progress and evaluating outcomes. Such a council would typically have an independent chair and would comprise of a mix of eHealth stakeholders, including government, health-care providers, health-care management and administrators and citizens' representatives.
Design and establish eHealth regulatory functions	Focuses on the design and establishment of a function geared towards implementing and enforcing national eHealth regulatory frameworks. For example, this function would be responsible for implementing and enforcing health information data-protection frameworks. The development of this function would need to address relationships and interactions with existing regulatory bodies and functions.
Design and establish national eHealth entity to direct and manage national eHealth investment	Global experience suggests that having a national entity that focuses on coordinating and overseeing the national eHealth strategy, investment and execution plays an important role in the development of a national eHealth environment. Such entities may also perform, or play a key role in standards development and solutions compliance.
Formalize governance interactions with other national, regional and local governance bodies	Dedicated eHealth governance functions, such as a national eHealth entity, will need to coexist with existing governance functions operating at a national, regional and local level. As such, there is a need to identify and formalize the relationships with these governance functions, and clearly define how they will interact with relation to eHealth strategy, investment and coordination.

Foundation activities

These activities typically focus on delivering those eHealth components that are needed to support the secure electronic exchange of health information across geographical and health-sector boundaries, or to improve access to health-care services through electronic channels. These activities develop the backbone for a national eHealth environment.

The activities are typically of national significance, and would be too risky or complex to deliver successfully unless through a strong nationally-coordinated approach. It may also be more cost effective to develop these activities just once at a national level rather than duplicating effort and expenditure across states, regions and the private sector (Table 18).

Table 18. Examples of foundation activities (not exhaustive)

Example activities	Description
Develop high-level requirements and design for foundation eHealth service	The implementation of foundation eHealth services (e.g. national health identifiers, national authentication, electronic health records, etc), begins with understanding the high-level requirements for the service and defining a high-level design for how the service would be delivered for the country.
Assess capacity and capability of existing government organizations or agencies to build, implement and operate a foundation eHealth service	Some nations may already have government organizations or agencies experienced in developing and operating national eHealth or similar services. These should be identified and assessed as part of determining the most suitable approach for sourcing the detailed design, build and operation of a foundation eHealth service.
Select implementation partner to perform detailed design and build a foundation eHealth service	This involves identifying, evaluating and selection an implementation partner or partners to undertake the detailed design and implementation of a foundation eHealth service that adheres to the high-level requirements and design.
Deploy and operate foundation eHealth service	Once developed, the foundation eHealth service will need to be deployed and operated reliably so that it supports the nation's eHealth environment.
Define eHealth standards development process	National eHealth standards are essential to ensuring that health information can be exchanged across geographical and health-sector boundaries. This requires a clear process for developing, reviewing, approving and publishing national eHealth standards, and which is supported by the health sector and the health ICT industry.
Review existing national and international standards	To avoid re-inventing the wheel, nations may wish to undertake a review of existing national and international eHealth and non-health standards to determine what can be re-used to deliver national eHealth standards. This may identify standards that can be re-used, standards that require profiling, or gaps that need to be addressed by the standards development process.
Develop and approve secure messaging standards	Ensuring that health information which is exchanged through a national eHealth environment remains private and confidential, can be authenticated and is delivered to the intended recipient, requires secure messaging between healthcare organizations and providers. To support this on a national scale, standards will be required on which secure messaging can be added to health information systems and which support the emergence of secure messaging service providers.
Develop and approve high-priority health information standards	Depending on the health system goals and challenges, a number of health information flows will likely have been identified as being a priority for delivery. Examples may include care event summaries, telehealth, electronic health records, diagnostic test results and so on. Enabling the exchange of these across health sector and geographical boundaries requires that appropriate information standards are developed that define the message.
Develop and approve standard terminologies	Ensuring that health information is communicated and interpreted in a consistent and accurate manner requires a standard language for describing health and clinical information, such as symptoms, diagnoses and treatments. This requires the development of standard terminologies.

Example activities	Description
Agree and adopt a nationally consistent regulatory framework for health information protection	Ensuring private and confidential information exchange requires a nationally consistent regulatory framework for health information protection. This is often a requirement where data protection legislation and frameworks differ, or conflict, at a national, state and regional level. Developing and adopting such a framework ensures that data protection, privacy, access and consent is approached and managed consistently at a national, state and regional level.
Establish mechanisms to improve computing infrastructure within health-care organizations and providers	A barrier to the adoption of eHealth can be the poor quality of computing infrastructure that exists across different parts of the health sector. Infrastructure can include PCs, network connectivity, and health information systems. There may be a need to undertake activities that design and establish mechanisms to encourage healthcare organizations and providers to invest in and improve their computing infrastructure. By this means, they provide the foundation required for collecting, recording and sharing electronic health information.
Define minimum computing infrastructure requirements for health-care organizations and providers	Assisting the health sector to improve its computing infrastructure requires a clear understanding of the appropriate levels of that infrastructure which need to be put in place, and maintained and refreshed on an ongoing basis.
Link health-care organization and provider accreditation to minimum computing infrastructure requirements	One potential method to drive improvements to health-care organization and provider computing infrastructure is to link this to their accreditation requirements. Although it is typically a long-term aspiration, such an activity can be used to encourage initial investment in computing infrastructure.
Identify high-priority care providers and communities requiring 'fit for purpose' data connectivity	Data connectivity is a key foundation for sharing electronic information between care providers, and for the provision of health-care services through electronic channels (e.g. telehealth). This activity needs to identify the priority health-care provider segments and communities that require investment in 'fit for purpose' data connectivity.
Develop data connectivity implementation design and plan	Investing in data connectivity infrastructure will require a high-level design for how data connectivity to priority care providers and communities can be achieved, and how this will be extended to the broader health sector and population.
Select implementation partner(s) to develop data connectivity infrastructure	Countries will most likely need to select data connectivity infrastructure providers and operators to assist in developing the required data connectivity infrastructure.
Deploy high-priority data connectivity infrastructure	Countries will work with selected providers and operators to deploy data connectivity infrastructure that enables high-priority parts of the health sector and population to interact with and benefit from the national eHealth environment.

Solutions activities

These activities focus on encouraging the development and use of high-priority eHealth services and applications to improve the efficiency and effectiveness of health-care management and delivery. This often focuses on ensuring that individuals, health-care providers and managers have access to the services and applications that allow them to access, view, use and share health information. These services and applications will often utilize eHealth components established through the activities delivered via the foundation action line (Table 19).

Table 19. Examples of solutions activities (not exhaustive)

Example activities	Description
Establish a national eHealth solutions investment fund	Design and establish an investment funding programme to encourage the development and implementation of high-priority eHealth solutions that support national standards and that can be effectively scaled and leveraged across the country's health sector.
Develop investment rules and criteria	Develop the rules and criteria required to guide the allocation of investment funds and establish appropriate investment fund governance, processes, control mechanisms and functions.
Foster development of high priority eHealth solutions	Engage with the health ICT industry and the broader health sector to build awareness and understanding of available investment funds and encourage the development of high-priority eHealth solutions
Design and establish a national solutions compliance function	Design and establish a national compliance function that is responsible for testing eHealth services and applications and certifying their compliance with national eHealth standards. The function must have sufficient authority, funds, infrastructure and resources to conduct effective national eHealth services and application testing and certification.
Develop compliance processes	Design and implement appropriate solutions compliance-testing processes and supporting technical infrastructure.
Operate certification process	Perform ongoing certification of eHealth services and applications as they emerge from the health ICT and broader health sector.
Develop and publish certification and compliance criteria	Develop and publish criteria that guide health-care organizations and vendors in determining what is required to certify their eHealth and other health ICT solutions as compliant with national eHealth standards.
Develop high-level requirement and design for priority national eHealth services and applications	The national eHealth vision may have identified a number of priority eHealth services or applications that should be developed and deployed on a national scale. This activity defines the high-level requirements and designs for these priority services or applications. Examples may include national electronic health record systems, health information exchange, health information portals, national prescription services, and health information datasets.
Select implementation partner to perform detailed design and build of national eHealth service or application	This involves identifying, evaluating and selection an implementation partner or partners to undertake the detailed design and implementation of a national eHealth service or application that adheres to the high-level requirements and design.
Deploy and operate national eHealth service or application	Once developed the national eHealth service or application will need to be deployed and operated reliably so that it can be accessed and used by the intended users (e.g. individuals, health-care organizations and providers, health-care managers and administrators).

Change and adoption activities

These activities focus on motivating, preparing and supporting the health sector in adopting and using eHealth as a core part of health services and systems. An important aspect of this is enabling participants in the health-care system to adopt eHealth services and applications, and to change their work practices so as to be able to use them effectively (Table 20).

Table 20. Examples of change and adoption activities (not exhaustive)

Example activities	Description
Identify and assess high-priority change and adoption targets	Identify the priority consumer, care provider and health-care manager stakeholder segments that should be targeted for eHealth adoption, assess their readiness to adopt specific eHealth solutions and identify opportunities to build momentum.
Develop eHealth awareness campaigns	Develop awareness campaigns that utilize appropriate communication mechanisms and forums to promote awareness of eHealth, specific eHealth services and applications, and the benefits of these.
Roll-out eHealth awareness campaigns	Roll-out awareness campaigns to high-priority change and adoption targets, and in time extend these to the broader health sector and public.
Establish framework for measuring effectiveness of engagement and awareness activities	Define clear criteria and targets for eHealth awareness and progress, and periodically measure actual awareness and programmes against these, to assess the effectiveness of eHealth change and adoption activities across consumers, care providers and health-care managers and administrators.
Establish national eHealth knowledge repository	Establish a national, web-based knowledge repository that captures eHealth project successes and enables sharing of learnings across the national health sector.
Develop financial incentive regime	Design a financial incentive programme to encourage the adoption and use of high-priority eHealth services and applications. This needs to include conditions of funding, eligibility criteria, application and approval processes, funding administration, and associated roles and responsibilities.
Develop financial incentive communications programme	Develop communication strategy and materials to publicize incentives and put in place necessary mechanisms to support this, including funding guidelines, information and application forms.
Roll-out financial incentive communications programme	Roll-out communications programme to high-priority change and adoption targets, and, in due course, extend this to the broader health sector.
Monitor eHealth solution adoption	Monitor adoption of priority eHealth solutions in target segments over time and scale-back financial incentives and other change and adoption activities as the tipping point is reached.
Define professional practice standards	Work with cross-sectoral stakeholders to guide the development of a professional practice standard for health-care providers, which should define the expectations and obligations of these providers to collect, store and share high-quality electronic health-care information in a timely, appropriate and secure manner.
Define new accreditation requirements	Identify and define changes to existing professional accreditation programmes for health-care organizations and individual healthcare providers to encompass eHealth.
Agree and implement new accreditation requirements	Liaise with the appropriate professional bodies and working groups to agree changes to accreditation requirements and implement these changes throughout high-priority segments of the health sector, and in time the broader health sector.
Define standard eHealth competency framework	Develop a standard eHealth competency framework for health workers and health ICT practitioners. This framework would provide an understanding of required eHealth knowledge, skills and attributes for these various professional groups.
Identify education and training course changes	Determine the changes that are required to existing education and training courses to ensure the development of eHealth workforce capabilities.
Implement education and training course changes	Work with education institutions (e.g. universities, vocational training institutions, professional bodies) to insert eHealth into their curricula.
Establish specialized eHealth courses and qualifications	Identify and establish nationally recognized tertiary qualifications in eHealth (e.g. health informatics) and implementing formalized training/education programmes designed to recognize and promote the spread of eHealth skills and expertise.
Design targeted stakeholder reference and working groups	Global experience suggests that the lack of meaningful engagement of health-care participants is often a significant barrier to the development of a national eHealth environment. This activity designs a set of targeted stakeholder engagement forums that have clear goals, objectives and deliverables.
Identify cross-sectoral representatives	Identify the participants to participate in targeted stakeholder engagement forums, ensuring broad and appropriate representation across health-care providers, professionals, governments, vendors, industry, consumers, community and other relevant stakeholder groups.
Engage and consult with stakeholder reference and working groups	Regularly engage and involve stakeholder reference and working groups throughout the development of the country's eHealth environment. These groups should be involved in exploring particular issues and risks related to the development of the country's eHealth environment, and the identification of acceptable solutions to these.

ANNEX E
Examples of eHealth activity risks

This Annex provides additional information regarding the potential risks that may be associated with the activities within the action plan. This is not intended to be an exhaustive list of risks but rather a means to assist readers in understanding common areas of risks that should be explored.

Leadership and governance risks

This area encompasses those risks that may have an impact on the ability to deliver effective leadership and governance of the eHealth action plan (Table 21).

Table 21. Examples of leadership and governance risks (not exhaustive)

Type of risk	Description
Lack of credible and high profile leader(s) to drive eHealth change	Like any large-scale change initiative, eHealth requires high-profile leadership that will provide top-level, sustained vision and commitment throughout the programme.
Inadequate governance and oversight mechanisms	Inadequate oversight mechanisms may impair decision-making, resulting in delivery delays and higher costs.
Conflicting agendas	Decision-makers from different levels of government, regions or parts of the health sector may have conflicting agendas and will be unable to reach agreement on implementation approach, activities or other aspects of the action plan.
Resistance to change existing governance mechanisms	Stakeholders may resist making changes to existing governance mechanisms that are required to support the delivery of the action plan, which will delay effective governance and oversight of activities.

Stakeholder engagement and buy-in risks

This area encompasses those risks that may have an impact on the ability to effectively engage with stakeholders and achieve their support as part of delivering the action plan for eHealth (Table 22).

Table 22. Examples of stakeholder engagement and buy-in risks (not exhaustive)

Type of risk	Description
Inadequate engagement with clinical stakeholders	Many eHealth programmes and projects have failed as a result of not ensuring adequate engagement and participation of clinical representatives in the design and delivery of eHealth transformation. This may result in technology and process changes that are not relevant to clinicians and do not add value to their practice.
Fragmentation in the health sector	Fragmentation of the health system may increase the complexity and effort associated with achieving effective stakeholder involvement.
Non-organized stakeholders	Some important stakeholders may not be organized in a manner that permits them to be easily engaged, yet their involvement is critical.
Resistance to 'eHealth'	Some parts of the health sector may resist the notion of eHealth, particularly those organizations, providers and individuals that do not understand what eHealth is, how it could be applied to address current challenges, and the benefits that it may deliver.
Inability to meet expectations	The activities within the action plan may not meet the expectations of various political, health-sector and other important stakeholders even if the programme delivers in accordance with objectives and scope.

Resource and funding risks

This area encompasses those risks related to the resources and funding required to deliver activities within the eHealth action plan (Table 23).

Table 23. Examples of resource and funding risks (not exhaustive)

Type of risk	Description
Scarcity of skills and expertise	The successful delivery of eHealth activities depends on skills and expertise which are not available or are difficult to access.
Competition for resources	National or international programmes or projects may generate competition for particular resources that will also be required to deliver eHealth activities.
Insufficient resource capacity	The successful delivery of activities within the action plan requires a greater number of skilled resources than are available to a country.
Imbalanced geographical distribution	The resources may not be geographically located where they will be required.
Scarcity of funding	There may be an inability to secure sufficient funding within the required time period to make the necessary investments in eHealth, meaning that the vision cannot be achieved.

Implementation approach risks

This area encompasses risks related to the implementation approach that is selected to deliver one or more strategic recommendations. An implementation approach is characterized by a set of inter-related activities that collectively seek to deliver outputs that support a strategic recommendation. Identifying these types of risks may require a broader analysis across a set of activities (Table 24).

Table 24. Examples of implementation approach risks (not exhaustive)

Type of risk	Description
Implementation focus too broad	Activities may attempt to focus too broadly, rather than targeting specific, high-priority needs and segments.
Ability for sector to accept change	Activities may be too aggressive in driving towards particular outcomes and not take account of the sector's capacity to accept and support activities, and the associated level of change required.
Not delivering early enough or fast enough	The implementation approach may not deliver tangible benefits early enough or fast enough to address the expectations of stakeholders. This may have an impact on perceptions about the ability of the government and other partners to deliver the programme, delaying the realization of benefits, and justifying ongoing investment in ad hoc eHealth solutions.

External dependency risks

This area encompasses risks arising from dependencies on elements that are not within the control of the action plan (Table 25).

Table 25. Examples of external dependency risks (not exhaustive)

Type of risk	Description
Required infrastructure not available	The action plan is dependent on the delivery of technology, business or other infrastructure, but this will not be available when required.
Required standards not available	The action plan is dependent on the delivery of data, technical or other standards but this will not be available when required.
Inability to re-use or share	The action plan is dependent on external systems or infrastructure that may prove unsuitable for re-use or sharing.
Vendor product and solution changes not available	The action plan is dependent on vendors having changed their products and solutions to support the national eHealth environment, but they will not be available to the marketplace when required.

Annex F
Public-private partnerships (PPPs)

What is a PPP?

A PPP represents a partnership between the public sector and the private sector for the purposes of designing, planning, financing, constructing and/or operating projects which would be regarded traditionally as falling within the remit of the public sector.

Why are PPPs used?

Governments may be attracted to a PPP arrangement for a variety of reasons. These commonly include:

- ▶ greater value for money than the public sector comparator
- ▶ sharing or transfer of risk to private-sector parties
- ▶ incentives for private-sector parties to perform well
- ▶ political attractiveness
- ▶ budgetary constraints.

What are the common types of PPP arrangements?

PPPs entail a sharing of responsibility between government and the private sector. There are various forms through which this can be achieved, which exist on a continuum of different combinations of public and private arrangements.

Common examples of PPP arrangements[5, 6] are listed below.

- ▶ **Operation and maintenance contract (O and M)**. These projects involve the private sector operating a publicly-owned facility under contract with the government.
- ▶ **Lease, develop and operate (LDO)**. This type of project involves a private developer being given a long-term lease to operate and expand existing infrastructure. The private developer agrees to invest in infrastructure improvements and can recover the investment plus a reasonable return over the term of the lease.
- ▶ **Build, operate and maintain (BOM)**. This arrangement involves the private-sector developer building, owning and maintaining infrastructure. The government leases the infrastructure and operates it using public sector staff.
- ▶ **Build, own, operate and transfer (BOOT)**. These projects involve a private developer financing, building, owning and operating infrastructure for a specified period. At the expiration of the specified period, the infrastructure is returned to the government.
- ▶ **Build, own and operate (BOO)**. These projects operate similarly to a BOOT project, except that the private sector owns the infrastructure in perpetuity. The developer may be subject to regulatory constraints on operations and, in some cases, pricing. The long-term right to operate the infrastructure provides the developer with significant financial incentive for the capital investment in the facility.

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5   Tasmanian Department of Treasury and Finance. *Guiding principles for private sector participation in public infrastructure provision.* Hobart, 2000.

6   Government of Karnataka. Infrastructure Development Department. *PPP models in practice. Bangalore, 2012* (http://idd.kar.nic.in/ppp-models.html, accessed 17 May 2012).

▶ **Build, lease and transfer (BLT)**: An arrangement whereby a concessionaire is authorized to finance and construct infrastructure, and upon its completion turn it over to the government agency or local government unit concerned on a lease arrangement for a fixed period. After this, ownership of the infrastructure is automatically transferred to the government agency or local government unit concerned.

▶ **Build-operate-share-transfer (BOST)**: An arrangement whereby a concessionaire is authorized to finance, construct, operate and maintain, share a part of the revenue and transfer the infrastructure at the end of the period. The proponent is allowed to recover its total investment, operating and maintenance costs plus a reasonable return thereon by collecting tolls, fees, rentals or other charges from infrastructure users.

Considerations for PPP arrangements

PPPs are complex mechanisms requiring extensive review to determine whether they are the preferred option for the delivery of public infrastructure. The overarching consideration for any PPP, irrespective of the sector or environment, should be *how will a PPP arrangement deliver value for money?*

Some other considerations regarding the potential use of PPP arrangements to deliver large-scale eHealth programmes are listed below.

▶ Technology projects are notoriously challenging as PPPs, in part due to the shorter lives of the technology assets compared to infrastructure. This may affect funding structure and conditions.

▶ Much of the value in a technology PPP derives from the abililty to transfer to the private sector, for example in regard to delivery (development and implementation) as well as ongoing support and maintenance.

▶ PPPs use a complex legal and financing structure which can be expensive and more time-consuming to establish than other mechanisms. This means that the project needs to be sufficiently large to warrant this investment.

▶ There will need to be sufficient depth and capability in the local market, particularly in regard to capital markets capacity to achieve funding for PPPs. There will also need to be sufficient depth and sophistication in the technology supplier market to be willing to enter into what are complex, risk-based transactions.

▶ As with all PPPs, a transparent and robust performance regime and payment mechanism will need to be put in place.

▶ PPPs require a favourable tax jurisdiction, particularly in regard to the treatment of depreciation, as this can be an important incentive.

▶ There is no 'one size fits all' PPP model. The short-, medium- and long-term requirements of projects need to be individually considered when determining the most appropriate PPP model.

It is important to recognize that PPPs are a distinct funding model, which should not be confused with the need to gain private-sector involvement in eHealth development. For example, the private sector may be involved through various forms of outsourcing.

ANNEX G
Definition of terms used in the Toolkit

Part	Term	Definition
Part I: **Establishing a national eHealth vision**	Strategic goals and challenges	Strategic health-sector goals and challenges and/or other national development goals that can be best supported by eHealth. While there may be many different health-sector goals and challenges, only some of these can be directly supported by eHealth.
	eHealth outcomes	What will be achieved or changed through using eHealth, and how the health system and services will change by: • improving the information flows within the health sector • improving electronic access to health services and information.
	eHealth vision	High-level statement that describes the strategic benefits and outcomes for the country in general or for the health system and population through the strategic changes to health system and services introduced by eHealth (eHealth Outcomes).
	National eHealth environment	The national eHealth environment is made up of eHealth components representing the enabling and foundation elements for eHealth as well as technical capabilities that form together an 'ecosystem' for eHealth in a country.
	eHealth components	The building blocks of a national eHealth environment that will allow the eHealth outcomes to be achieved. They describe what is needed to be introduced or strengthened to achieve the eHealth vision in terms of: • Leadership and governance • Strategy and investment • Services and applications • Infrastructure • Standards and interoperability • Legislation, policy and compliance • Workforce.
	Strategic recommendations	Strategic recommendations describe the high–level actions required to deliver the national eHealth environment. These actions may describe how new eHealth components will be delivered, or how existing eHealth components will be repurposed or extended.
Part 2: **Developing an eHealth action plan**	Action lines	Broad areas to group national activities of similar focus and intent that are required to deliver a nation's eHealth vision.
	eHealth outputs	The specific achievements, deliverables, results or changes required to deliver a strategic recommendation.
	Activities	The set of activities which need to be undertaken to deliver a particular output.
Part 3: **National eHealth monitoring and evaluation guidelines**	Output indicators	Indicators that provide insights into the adoption and take-up of eHealth within the country's health sector.
	Outcome indicators	Indicators that provide insights into the tangible results for stakeholders that arise from the adoption and use of eHealth.

Worldwide, the application of information and communication technologies to support national health-care services is rapidly expanding and increasingly important. This is especially so at a time when all health systems face stringent economic challenges and greater demands to provide more and better care, especially to those most in need.

The *National eHealth Strategy Toolkit* is an expert, practical guide that provides governments, their ministries and stakeholders with a solid foundation and method for the development and implementation of a national eHealth vision, action plan and monitoring framework. All countries, whatever their level of development, can adapt the Toolkit to suit their own circumstances.

Representing one of the most significant collaborations in recent years between the World Health Organization and the International Telecommunication Union, the Toolkit is a landmark in understanding what eHealth is, what it can do, and why and how it should be applied to health care today.

Cover art: base map made with Natural Earth;
illustration by Marilyn Langfeld

National eHealth Strategy Toolkit

Monitoring and Evaluation

National eHealth Strategy Toolkit

PART 3

Monitoring and Evaluation

World Health Organization

ITU

PART 3
Monitoring and evaluation

Purpose

Part 3 of the *National eHealth Strategy Toolkit* is a guide to establishing a framework to monitor the action plan developed in Part 2, and to evaluate the outcomes. The main aspects of this work are the development of indicators and targets to be measured, and the definition of the governance and processes required.

Audience

Like Parts 1 and 2 of the Toolkit, Part 3 is intended for use primarily by government, ministerial and health sector leaders, including personnel in health ministries, departments and agencies who will monitor and evaluate their national eHealth action plan. It is designed to be used by countries that have developed a national eHealth vision and action plan using the previous two parts, with the assumption that the outputs from them are available and have been endorsed. Part 3 should also be of use to other decision-makers who have developed their action plans but are uncertain how to monitor and evaluate the results.

Overview

The Toolkit provides a framework and method for the development of a national eHealth vision, action plan and monitoring and evaluation framework. The Toolkit is designed in three parts, with the second and third building progressively on the work of Part 1.

- ▶ Part 1: A national eHealth vision that responds to health and development goals.
- ▶ Part 2: A national eHealth action plan that reflects country priorities and the eHealth context.
- ▶ Part 3: A plan to monitor implementation and evaluate outcomes achieved.

How this Toolkit will be used, and the end result, will be based on a country's context, priorities and vision.

| Part 1
National eHealth vision | Part 2
National eHealth action plan | Part 3
National eHealth monitoring and evaluation (This document) |
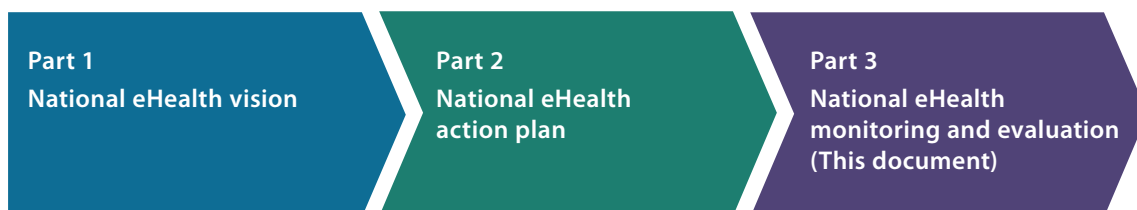
Orientation to Part 3

Part 3 provides guidance on establishing a national monitoring and evaluation framework.

▶ The introduction summarizes the outputs of Part 2 and how these relate to monitoring and evaluation.

▶ Chapters 1–2: The elements of a monitoring and evaluation framework, and the method by which the framework is developed.

▶ Chapters 3–5: Detailed guidance on defining a national monitoring and evaluation framework.

Annexes provide additional information to support this Toolkit, including a definition of terms.

Contents

Part 3. Monitoring and evaluation

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INTRODUCTION
Assessing progress and results

National eHealth vision and action plan

By this point, a government will typically have established a national vision for eHealth and an eHealth action plan, by completing Parts 1 and 2 of the Toolkit. The action plan will have been endorsed by health-sector leadership and supported by the broader stakeholder environment.

The action plan should describe:

▶ the action lines required to implement the national eHealth vision

▶ the outputs and related activities for each action line

▶ the dependencies and timings of activities

▶ the resources required to deliver the outputs and activities

▶ the phases in which the action plan will be implemented.

Monitoring and evaluation framework for eHealth

A monitoring and evaluation framework enables a government to track and assess the results of implementing the eHealth action plan. 'Results-based management' is the management strategy used by the United Nations[1] (Figure 1) and adopted in the Toolkit. The approach focuses on performance and on achievement of outputs, outcomes and impacts by:

▶ defining indicators that provide insight into the adoption of eHealth and the tangible results for health and non-health stakeholders;

▶ identifying indicator baseline and target measures to allow monitoring and evaluation of progress over the duration of the plan; and

▶ describing the governance and processes required.

Figure 1. Results-based management
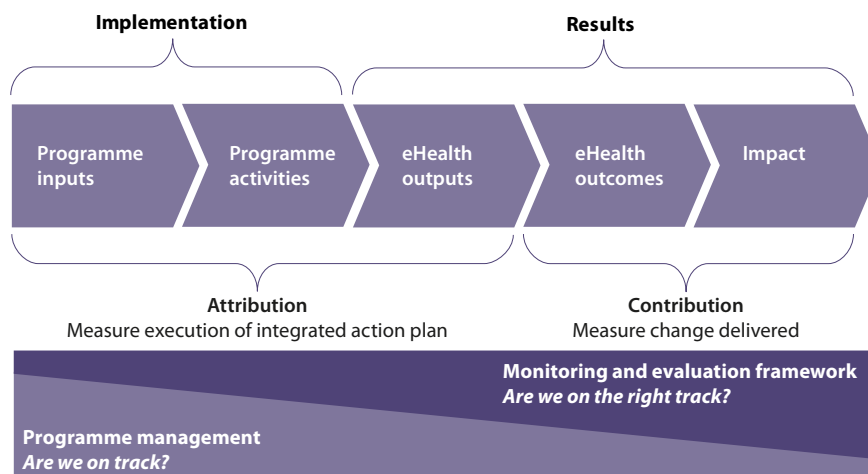
1 United Nations. *Programme performance assessment in results-based management* (http://www.un.org/Depts/oios/mecd/un_pparbm/index.htm, accessed 17 May 2012).

A clear distinction should be made between a monitoring and evaluation framework for a national eHealth strategy and the programme management activities that are designed to implement and manage a large-scale eHealth action plan.

Programme management monitors the execution of the action plan, and is central in answering the question of *whether the country is on track in terms of its implementation of a national eHealth environment.* It focuses on three main components.

▶ *Programme inputs:* funding, budgets, resources and other inputs required to deliver the eHealth action plan.

▶ *Programme activities:* these correspond to the activities defined in the action plan.

▶ *eHealth outputs:* the deliverables, such as eHealth components, resulting from the activities undertaken.

By contrast, a monitoring and evaluation framework *complements* programme management by looking primarily at results. It overlaps programme management and enables a country to determine whether it is on the right track. But it goes further to answer the question of whether the action plan is delivering the outcomes, impact, and level of change anticipated. It also focuses on three main components:

▶ *eHealth outputs:* the deliverables, such as eHealth components, resulting from the activities undertaken (as above).

▶ *eHealth outcomes:* the strategic outcomes that eHealth outputs enable, or contribute to enabling.

▶ *Impact:* the change that eHealth outcomes create for health and non-health sector stakeholders.

A monitoring and evaluation framework assigns accountability (who), and determines the approach (how) and timing (when) for measuring the results. Part 3 of the Toolkit focuses specifically on eHealth. Countries seeking information on programme management should refer to one of the programme management frameworks that are in wide use, such as PMBOK® or PRINCE2® [2].

The strategic importance of monitoring and evaluation

Monitoring and evaluation plays an essential role in demonstrating the progress that a country is making towards the development of its national eHealth environment, and the results or changes that these efforts are delivering. The outputs of monitoring and evaluation form a critical part of ongoing communication regarding a country's national eHealth programme, which in turn is essential to building the support of stakeholders for further adoption and investment in eHealth.

In particular, communicating the progress and results of the eHealth action plan is important in demonstrating to donors or funders the impact of their investments. It can also help in building trust and understanding with potential funders as to how their contribution would be used to further the country's national eHealth programme.

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2   Project Management Institute. *Making project management indispensable for business results.* Philadelphia, PA, 2012 (http://www.pmi.org/, accessed 17 May 2012).

PRINCE2.com. London, 2012 (http://www.prince2.com, accessed 17 May 2012).

Establishing a national monitoring and evaluation framework

Establishing a successful national monitoring and evaluation framework requires dedicated resources and effort, often at various levels, to develop, manage and operate an effective process. Governments should consider monitoring and evaluation as part of the planning and costing of their national eHealth programmes, thereby ensuring that appropriate resources are dedicated to the work.
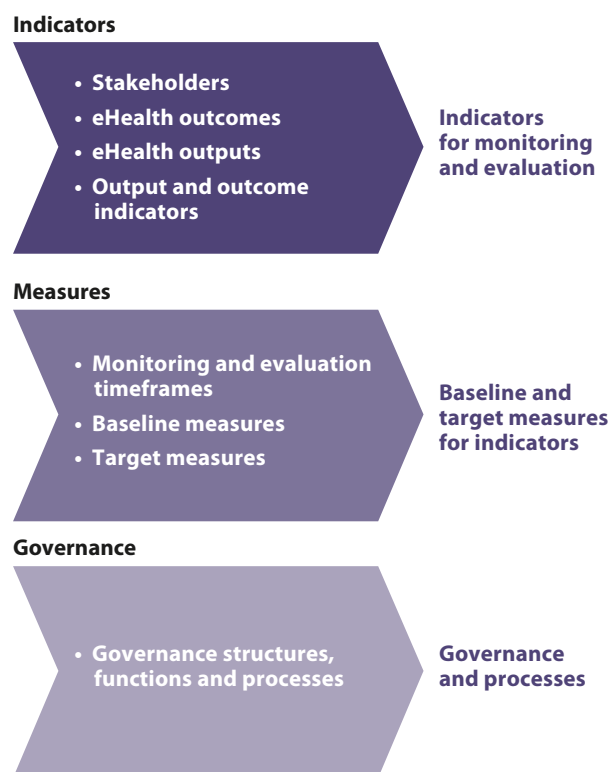
Countries using their own results-based management approaches are encouraged to ensure that they encompass the concepts described in the results chain shown in Figure 1. Annex A provides additional information regarding results-based management.

CHAPTER 1
eHealth monitoring and evaluation framework

This section describes the elements to be considered in establishing a monitoring and evaluation framework for a national eHealth programme (Figure 2).

Figure 2. Elements of an eHealth monitoring and evaluation framework

Indicators

- **Stakeholders**
- **eHealth outcomes**
- **eHealth outputs**
- **Output and outcome indicators**

Indicators for monitoring and evaluation

Measures

- **Monitoring and evaluation timeframes**
- **Baseline measures**
- **Target measures**

Baseline and target measures for indicators

Governance

- **Governance structures, functions and processes**

Governance and processes

1.1   Indicators for eHealth

An effective monitoring and evaluation framework is constructed around a set of meaningful indicators, the measurement of which provides insight into the adoption, use and results that eHealth is delivering.

Meaningful indicators should include the perspective of stakeholders, as this ensures that changes or improvements important to stakeholders are measured. Developing and selecting these indicators requires an understanding of eHealth outcomes (formed during Part 1) and outputs (formed during Part 2) that are important to each stakeholder.

There are two types of indicators to consider.

- ▶ *Output indicators* provide information and insight on the adoption of eHealth.

- ▶ *Outcome indicators* provide information and insight on the results obtained.

1.2   Indicator measures

Monitoring the progress of the action plan requires an understanding of where a country is starting from (baseline measures), and what it is expecting to achieve (target measures). Targets should be defined for a range of timeframes throughout the duration of the action plan.

1.3   Governing monitoring and evaluation

National governance provides oversight, coordination and guidance for monitoring and evaluation efforts, and ensures timely intervention when there appears to be divergence between what is actually happening and what a country was aiming to achieve through its eHealth programme. Governance must be supported by processes that direct how the adoption and results of eHealth are monitored and evaluated.

CHAPTER 2
Developing an eHealth monitoring and evaluation framework: overview

This section describes how a monitoring and evaluation framework can be developed (Figure 3).

Figure 3. A method for developing an eHealth monitoring and evaluation framework

This is a sequential process that begins with determining the indicators to be monitored and outcomes to be evaluated. Baseline and target measures are set for each indicator. Targets serve as the basis for tracking actual progress against planned progress, and determining whether corrective action is required. A monitoring and evaluation framework also describes the governance model and processes through which national monitoring and evaluation will be performed. Stakeholders are consulted throughout the process in order to gain commitment and understanding, as well as to ensure that their roles are considered in the governance structure and processes.

The development of a monitoring and evaluation framework is closely linked to the outputs of Parts 1 and 2 of the Toolkit, in particular:

▶ the important health- and non-health-sector stakeholders

▶ the *eHealth outcomes* on which the national eHealth vision is based

▶ the *eHealth outputs* that the action plan will deliver

▶ the implementation phases and timing for delivery of these outputs.

A considerable portion of developing a monitoring and evaluation framework involves using this existing knowledge.

2.1   Define indicators for eHealth

This step determines the purpose of monitoring and evaluation, based on the eHealth vision, action plan and stakeholder perspectives. It focuses on developing a set of eHealth output and outcome indicators that will measure the results that eHealth delivers. An important aspect is to consider the consultations completed with stakeholders in Part 1, and to link a number of the indicators to outcomes important to stakeholders. It is also important to link indicators to timeframes for measuring other health outcomes where possible (for example, in the national health system reporting processes) to show the contribution of eHealth to these outcomes and to avoid creating separate reporting processes.

2.2 Define baseline and target measures for indicators

This step validates the baseline measures and creates target measures for each indicator. Target measures are defined for different timeframes so that progress can be monitored throughout the execution of the plan.

2.3 Define supporting governance and processes

This stage defines the governance and processes within which the monitoring and evaluation of eHealth adoption and associated results will be undertaken. Experience shows that monitoring the progress of, and evaluation of, eHealth may be carried out at multiple levels and by multiple parties. It is important that these various efforts are planned and executed within an overall national monitoring and evaluation model.

CHAPTER 3
Define indicators for eHealth

This stage focuses on defining the indicators that will be monitored and the outcomes that will be evaluated during the implementation of the eHealth action plan.

Indicators   **Measures**   **Governance**

Define indicators for eHealth	Define baseline and target measures for indicators	Define supporting governance and processes

Objective

This step defines eHealth output and outcome indicators that will assist in measuring the results of the eHealth action plan. Indicators should be linked to the stakeholders and outcomes identified in Part 1, so that the true success of eHealth is understood, above and beyond noting the progress of eHealth implementation.

Activities

▸ Identify priority stakeholders for whom it is critical to show results in eHealth.

▸ Review eHealth outcomes for priority stakeholders.

▸ Identify the eHealth outputs that will lead to these outcomes.

▸ Review and confirm focus areas with priority stakeholders.

▸ Develop eHealth adoption and outcome indicators.

Outputs

▸ eHealth output indicators, which will be used to measure the adoption and take-up of eHealth within the health sector.

▸ eHealth outcome indicators, which will be used to measure the results of the adoption and take-up of eHealth.

3.1   Identify priority stakeholders

Objective

This step prioritizes the health- and non-health-sector stakeholders identified in Parts 1 and 2 of the Toolkit for whom it is important to show results of the eHealth action plan. The development of indicators should be informed by the perspective of stakeholders, minimizing the risk that indicators are based on programme delivery alone.

Recommended outputs

This step should determine the priority health- and non-health-sector stakeholders for whom it is especially important to demonstrate eHealth outcomes. It is recommended that stakeholders are described at the level of an organization, group or role, rather than as a specific individual or political party, because these will change with time. For example, a stakeholder could be defined as the 'Department of Health' (organization-level) or the 'Health Minister' (role-level) rather than the particular individual fulfilling the role of the health minister. An example of a stakeholder group could be 'Individuals aged 65 years or older'.

Approach

This step is based on the knowledge of multisectoral stakeholders developed in Parts 1 and 2. As this may be a long list, this step should focus on stakeholders for whom the demonstration of progress and outcomes of eHealth is important in building support and momentum for further adoption of and investment in eHealth.

Stakeholders for whom eHealth outcomes may be especially important are:

▸ consumers

▸ healthcare providers

▸ healthcare managers and administrators

▸ health and medical researchers.

Funding bodies, such as social and economic development agencies and other donors, should also be considered. While they are not direct beneficiaries of eHealth programmes, these bodies may have stipulated requirements for monitoring implementation progress and the results of their investment in a national eHealth programme (as part of their provisions of funding).

3.2   Review eHealth outcomes for priority stakeholders

Objective

This step identifies the outcomes that delivering the eHealth action plan will have for the stakeholders identified above. As delivering the outcomes leads to concrete improvements and results for stakeholders, indicators should be based on them. The outcomes should be linked to each of the prioritized stakeholders and explored from each shareholder's perspective in order to describe what delivering each outcome will mean for them. For example, the improvements or changes that a particular stakeholder will experience through the realization of a particular eHealth outcome (Figure 4).

Figure 4. Relationship between stakeholders, eHealth outcomes and indicators
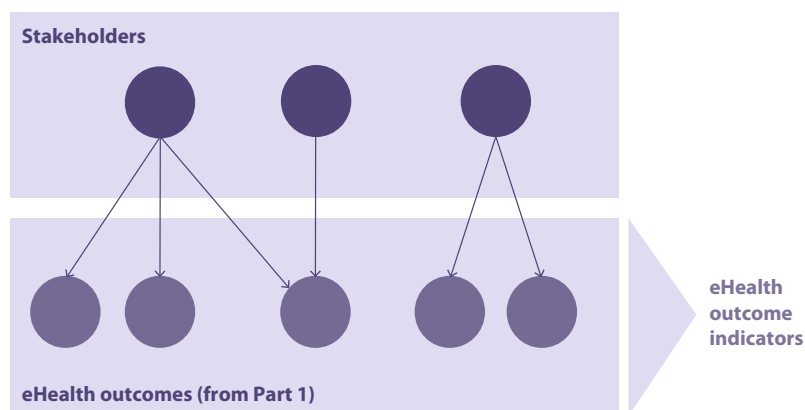
Recommended outputs

This step should describe the expected outcomes (concrete improvements) for each prioritized stakeholder. These will be based on the eHealth outcomes described in Part 1 of the Toolkit (Table 1).

Table 1. Examples of eHealth outcomes for stakeholders (non-exhaustive)

Stakeholder	Examples eHealth outcomes
Consumers	• Improve the ability of consumers located in rural and remote locations to access primary care services, and reduce the need to travel large distances to access care. • Enable pregnant women in rural and remote areas to access knowledge and services to assist in managing their pregnancy. • Enable consumers to access knowledge and services that support early detection and treatment of preventable communicable and noncommunicable diseases. • Improve care coordination by ensuring their health information can be easily exchanged between their health-care providers. • Improve access to knowledge resources and support for better management of their chronic conditions, and their adherance to treatment and medication regimes.
Health-care providers	• Improve the ability of providers to access health information at the point of care. • Improve the ability of providers to exchange patient information with other providers. • Enable providers to interact with consumers who are located remotely. • Enable providers to monitor and track their patients more effectively. • Enable providers to access clinical knowledge, evidence and expertise to support skills development and the delivery of health care within their local communities.
Health-care managers and administrators	• Support national and regional health authorities to predict and plan for the spread of infectious diseases. • Enable health authorities to monitor and respond to outbreaks and other emergencies more effectively and to meet reporting obligations. • Support the education, training and development of the country's health workforce. • Provide reliable and quality data to inform and monitor the results of clinical, policy, investment and administrative decisions. • Provide access to quality data sources that inform service and workforce planning and management. • Enable effective management of the supply, distribution and availability of vaccines and essential medicines.
Health and medical researchers	• Provide researchers with greater access to evidence-based information to support clinical decision-making and treatment design and assessment. • Improve access to the medical literature, knowledge networks and resources.

Approach

This step is based on the eHealth outcomes developed during the development of the national eHealth vision in Part 1[3]. Formulating the vision involved defining a set of *eHealth outcomes*, which answered the question of *what will be achieved or changed through using eHealth*? The process of developing the vision also involved exploring what each of these eHealth outcomes would mean for stakeholders[4].

This activity should take these eHealth outcomes and refine them where required to describe the concrete results that the vision is expected to deliver to each stakeholder. The descriptions should be concrete enough to support the identification of indicators that will allow these outcomes to be measured.

3.3   Identify eHealth outputs that will lead to these outcomes

Objective

This step identifies the outputs of the eHealth action plan that will lead to the eHealth outcomes identified in Section 3.2. This understanding provides the context for identifying eHealth output indicators (Figure 5).

Figure 5. Relationship between stakeholders, eHealth outcomes and outputs, and eHealth output indicators
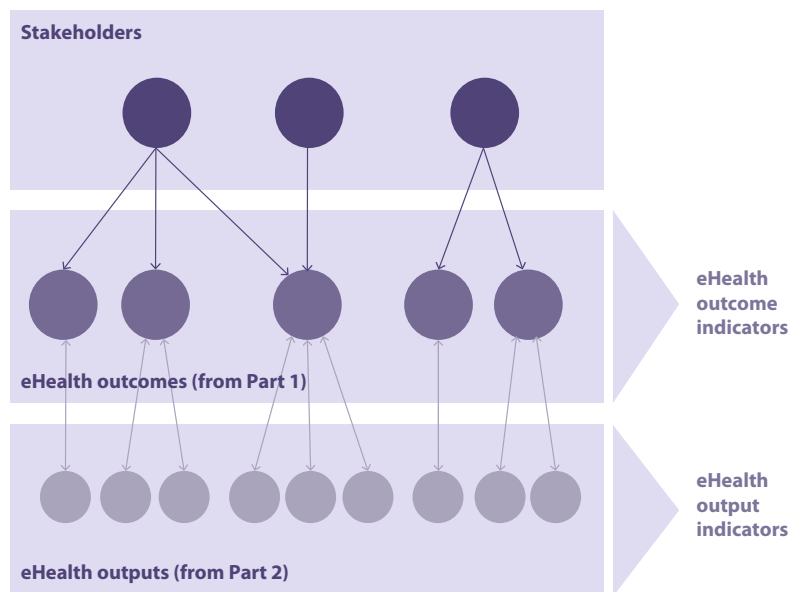
The eHealth outputs and associated activities defined in the action plan (Part 2) should be linked to the eHealth outcomes defined in the previous step.

Recommended outputs

This step should define a set of outputs for each eHealth outcome (Table 2).

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3   Refer to Part 1, Section 8.2 Define the eHealth outcomes.

4   Refer to Part 1, Section 8.5 Describe what eHealth vision will mean for stakeholders.

Table 2. Examples of eHealth outputs (non-exhaustive)

Stakeholder	eHealth outcomes	Associated eHealth outputs
Consumers	Improve the ability of consumers located in rural and remote locations to access primary care services, and reduce the need to travel large distances to access care.	• Fit-for-purpose data/telecommunications connectivity established to rural and remote communities • National telemedicine service established • Fit-for-purpose computing/access infrastructure deployed to rural and remote communities • Telemedicine education and awareness programmes delivered to rural and remote communities
	Enable pregnant women in rural and remote locations to access knowledge and services to assist in managing their pregnancy.	• Fit-for-purpose data/telecommunications connectivity established to rural and remote communities • National pre/postnatal health knowledge portal established • SMS-based pre/postnatal support service established • Fit-for-purpose computing/mobile handset infrastructure deployed to rural and remote communities • Health knowledge and SMS support service education and awareness programmes delivered to rural and remote communities
Care providers	Improve the ability for providers to exchange a patient's health information with other providers.	• National eHealth data and messaging standards approved • Unique health identifiers exist for consumers and care providers • Standard-compliant care provider software available from vendors • Fit-for-purpose care provider computing infrastructure deployed • Fit-for-purpose data/telecommunications connectivity established to care providers • National electronic health record (EHR) system available • Consumers have opted in to have their health information shared via the national EHR system
	Enable providers to access clinical knowledge, evidence sources and expertise to support skills development, and the delivery of health-care within their local communities.	• Fit-for-purpose data/telecommunications connectivity established to health facilities and care providers • National care provider knowledge portal service established • Mobile knowledge and decision support applications developed and deployed • Fit-for-purpose computing/mobile infrastructure deployed to care providers
Health-care managers and administrators	Enable national and regional health authorities to monitor, and respond to outbreaks and other emergencies, in a more rapid manner.	• Fit-for-purpose data/telecommunications connectivity established for the health sector • Fit-for-purpose computing/mobile infrastructure deployed • National disease management and reporting portal service established • Surveillance applications for mobile devices developed and deployed
	Support the education, training and development of the country's health workforce.	• Fit-for-purpose data/telecommunications connectivity available to the workforce • Fit-for-purpose computing infrastructure deployed available to potential workers • eLearning portal service and applications established • Awareness programmes delivered regarding training options

Approach

This step is based on the eHealth outputs developed in Part 2 of the Toolkit[5].

Some eHealth outputs will be delivered progressively over time (such as the adoption of a particular eHealth solution by care providers) while others will represent a 'point in time' event.

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5   Refer to Part 2, Section 5.2 Assign outputs to action lines.

3.4   Review and confirm focus areas with priority stakeholders

Objective

This step confirms the eHealth outcomes and outputs for monitoring and evaluation, which involves reviewing with stakeholders. This step allows the relative importance of different eHealth outcomes and outputs to emerge. This is particularly important given that the resources to undertake monitoring and evaluation will likely be limited and therefore measuring 'everything' is unlikely to be possible.

This step also provides an opportunity to:

- ▶ build stakeholder support
- ▶ gather stakeholder input on indicators that could be used
- ▶ communicate the expected outcomes relevant to stakeholders.

Recommended outputs

This step should produce a list of the eHealth outcomes and associated outputs that will be the focus of national monitoring and evaluation efforts.

Approach

This step will require consultation with stakeholders to review and confirm the eHealth outcomes and outputs that are of particular importance to them. Consultation should focus on understanding those aspects that 'must' be monitored and evaluated, versus those that 'should' or 'could' be measured. Typically this discussion will tend to focus more on stakeholder priorities in the short to medium timeframes.

Once eHealth outcomes and outputs are prioritized, stakeholders should also be consulted regarding the indicators that they regard as being practical and appropriate to measure.

## 3.5   Define eHealth output and outcome indicators

Objective

This step defines the indicators that will be used throughout the execution of the eHealth action plan. Two types of indicators should be considered.

- ▶ *eHealth output indicators* provide information and insight into the adoption of eHealth
- ▶ *eHealth outcome indicators* provide information and insight into the results for stakeholders.

Output indicators are derived from the eHealth outputs.

Outcome indicators are derived from the eHealth outcomes. These indicators are closely related, in that the rate of adoption (measured by eHealth output indicators) will drive the expected improvements (measured by eHealth outcome indicators) (Figure 6).

Figure 6. Relationship between eHealth outcome and output indicators
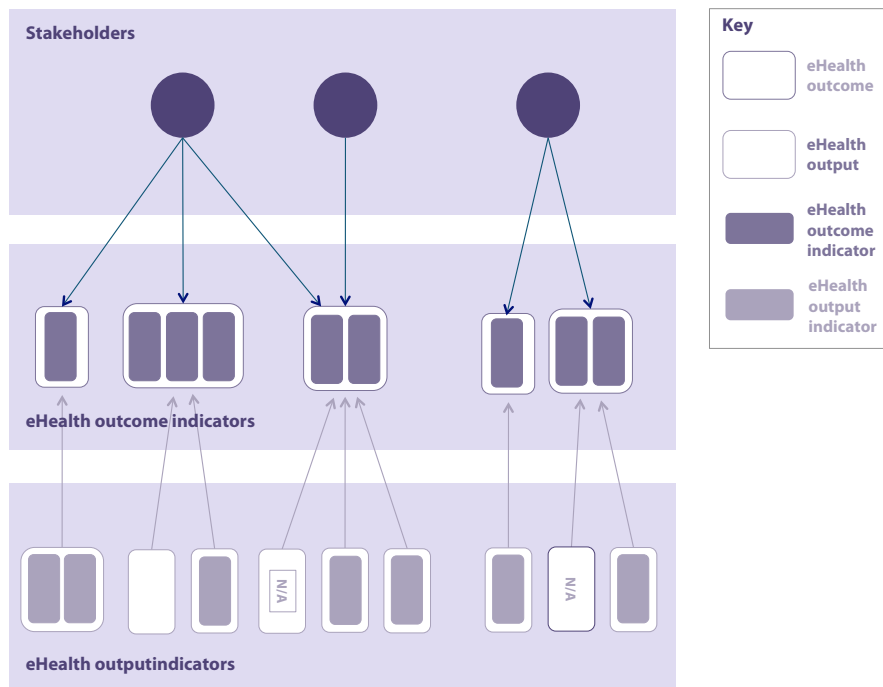
Typically, eHealth output indicators are used for those outputs that are delivered progressively, such as the deployment of data communications infrastructure, or the take-up of standards-compliant software by care providers.

Recommended outputs

This step should produce meaningful indicators that can be used to monitor and evaluate the results of implementing the eHealth action plan (Table 3).

Table 3. Example of eHealth outcome indicators (non exhaustive)

Stakeholder	eHealth outcomes	Indicators
Consumers	Improve the ability for consumers located in rural and remote locations to access primary care services, and reduce the need to travel large distances to access care.	• Percentage increase in the number of primary care-related consultations conducted via telemedicine • Percentage increase in the number of rural and remote consumers that can gain access to primary care services via telemedicine • Average reduction in time for a rural or remote consumer to access primary care services as a result of telemedicine • Consumer satisfaction regarding role of technology in improving their access to health services
Care providers	Improve the ability for providers to exchange a patient's health information with other providers.	• Percentage increase in the number of electronic health information transactions between health-care providers • Percentage reduction in clinician time gathering consumer health and medical history • Percentage increase in the number of discharge summaries being received by primary care providers • Provider satisfaction of using eHealth to improve information sharing with other providers
	Enable providers to access clinical knowledge, evidence sources and expertise to assist with skills development, and the delivery of health care within their local communities.	• Percentage increase in visits to national care provider knowledge portal • Provider satisfaction of using eHealth to improve access to knowledge and expertise to support them in delivering care

Stakeholder	eHealth outcomes	Indicators
Healthcare managers and administrators	Enable national and regional health authorities to monitor and respond to outbreaks and other emergencies, in a more rapid manner.	• Percentage reduction in time to detect, intervene and contain an emerging disease outbreak or similar threat • Percentage reduction in time and cost to report and analyse disease outbreaks to support decision-making processes and resource allocation decisions • Perceptions of issues/challenges affecting use of eHealth for monitoring and response
	Support the education, training and development of the country's health workforce.	• Percentage increase in the number of health workers entering the health workforce that have been trained in part through eLearning and other similar e-based training • Percentage growth in the number of people enrolling for electronic-based education and training programmes

Table 4 provides examples of eHealth output indicators for the various eHealth outcomes and associated indicators listed in the above table.

Table 4. Example of eHealth output indicators (non exhaustive)

Stakeholder	eHealth outcome indicators	eHealth output indicators
Consumers	• Percentage increase in the number of primary care-related consultations conducted via telemedicine • Percentage increase in the number of rural and remote consumers that can gain access to primary care services via telemedicine • Average reduction in time for a rural or remote consumer to access primary care services as a result of telemedicine • Consumer satisfaction regarding role of technology in improving their access to health services	• Percentage of rural and remote communities that have access to fit-for-purpose data/telecommunications connectivity • Percentage of rural and remote communities that have access to computing/access infrastructure • Percentage of rural and remote communities that have been educated regarding the availability and benefits of the national telemedicine service • Outputs from consumer satisfaction survey and focus groups
Care providers	• Percentage increase in the number of electronic health information transactions between health-care providers • Percentage reduction in clinician time gathering consumer health and medical history • Percentage increase in the number of discharge summaries being received by primary care providers • Provider satisfaction of using eHealth to improve information sharing with other providers • Provider perceptions of issues/challenges impacting their use of eHealth to support improve information sharing	• Percentage of health-care providers that have standards-compliant software systems • Percentage of consumers and health-care providers that have obtained their unique health identifier • Percentage of health-care providers that have access to fit-for-purpose data/telecommunications connectivity • Percentage of health-care providers that have access to fit-for-purpose computing infrastructure • Percentage of consumers that have registered to participate in the national EHR system • Outputs from provider satisfaction survey • Outputs from provider reference group discussions
	• Percentage increase in visits to national care provider knowledge portal • Percentage of consultations which are being supported by mobile handset knowledge and decision support applications • Provider satisfaction of using eHealth to improve access to knowledge and expertise to support them in delivering care	• Percentage of rural and remote health-care providers that have access to fit-for-purpose data/telecommunications connectivity • Percentage of rural and remote health providers that have downloaded and installed a knowledge and decision support applications • Percentage of rural and remote health-care providers that have been educated regarding the availability and benefits of the national care provider knowledge portal • Outputs from provider satisfaction survey • Outputs from provider reference group discussions

Stakeholder	eHealth outcome indicators	eHealth output indicators
Health-care managers and administrators	• Percentage reduction in time to detect, intervene and contain an emerging disease outbreak or similar threat • Percentage reduction in time and cost to report and analyse disease outbreaks to support decision making processes and resource allocation decisions • Perceptions of issues/challenges impacting their use of eHealth to monitor, track and respond to disease outbreaks and other emergencies	• Percentage of health-care providers that have access to fit-for-purpose data/telecommunications connectivity • Percentage of health-care providers that have access to fit-for-purpose computing infrastructure • Percentage of rural and remote health-care providers that have access to mobile handset/coverage • Percentage of health-care providers that have registered to provide information through the national disease management and reporting portal • Percentage of health-care providers that have downloaded and installed mobile handset diseases recording applications, and have registered to provide data through these applications • Percentage of health-care providers that have been educated regarding the availability and benefits of using the national disease management and reporting portal, and the mobile handset applications • Outputs from reference group discussions conducted with members of relevant health-care manager or administrator organizations
	• Percentage increase in the number of health workers entering the health workforce that have been trained through eLearning and other similar e-based training	• Percentage of potential workforce population that have access to fit-for-purpose data/telecommunications connectivity • Percentage of potential workforce population that have access to fit-for-purpose computing infrastructure • Percentage growth in the number of people enrolling for electronic based education and training programmes • Percentage of potential workforce that have been educated regarding the availability and benefits of health/medical eLearning

Quantitative indicators minimize the level of ambiguity regarding the results achieved. Some outcomes require the use of qualitative indicators, which are usually derived from surveys, questionnaires, feedback and other evaluation mechanisms, and may also allow for greater insights into the potential cause(s) of divergence from expected results. The choice of indicators is explored further in the following section.

Approach

This activity requires internal analysis to define a set of candidate eHealth output and outcome indicators, which can then be confirmed with stakeholders. It also requires working through each outcome or output, and answering the question of *what needs to be monitored or measured to monitor progress towards that outcome or output*.

Consultation with stakeholders should focus on confirming the initial set of candidate indicators and identifying any others that should be considered. This may include confirming that indicators meet the criteria that they are observable, reliable and controllable (Table 5). Subject-matter experts and stakeholders may be consulted on how best to measure a particular eHealth outcome or output.

Table 5. Suggested criteria for selecting indicators

Criteria	Meaning
Linked to objectives	Indicators should provide information that can be linked to and support the monitoring and evaluation of eHealth outcomes and outputs
Quantifiable	Indicators should be concrete, as opposed to conceptual, and should be measurable and easily expressed in relevant units of measurement
Observable	Measurement data exists (or will exist) that will allow an indicator to be derived
Reliable	The data used for the indicators should not be arbitrarily derived and should reflect accurate, verifiable information as much as is possible
Controllable	Indicators should measure the results of delivering the eHealth action plan, and should be selected to control the potential impact of activities that fall outside the scope of the plan
Ongoing and comparable	Indicators should provide information that is comparable and relevant across periods, rather than being 'one time' indicators of progress

There is little value in defining a set of indicators where the data do not exist or cannot be regularly collected, analysed and reported. This step should consider the reality of the country's current environment, in particular the challenges or barriers that exist to gathering the required data. The result of this may be the need to consider using a mixture of quantitative and qualitative indicators.

In practice, a country will use a mixture of both quantitative and qualitative measures over the course of implementing the plan. Both types of measures can play a useful role in understanding whether the desired outcomes and outputs are being delivered, as well as providing insights into the results obtained. Countries need to ensure that the appropriate skills and expertise exist to do both types of research.

CHAPTER 4
Define baseline and target measures for indicators

This stage focuses on defining the baseline and target measures for each of the defined indicators.

Indicators

Measures

Governance

Define indicators
for eHealth

Define baseline
and target measures
for indicators

Define supporting
governance and
processes

Objective

This stage defines baseline and target measures for each indicator along with the timeframes for measuring indicators against targets.

Baseline measures provide an understanding of a country's starting point and assist in defining realistic and achievable targets, which allow evaluation of the progress in implementing the plan (i.e. Are we achieving what we set out to achieve?).

Evaluating indicators against targets should occur at regular intervals to ensure that the programme is delivering tangible results to stakeholders in a timely manner and that potential problems are identified and addressed as soon as possible.

Activities

▶ Determine national monitoring and evaluation timeframes.

▶ Identify baseline measures for each indicator.

▶ Define target measures for output indicators.

▶ Define target measures for outcome indicators.

Outputs

▶ Indicator monitoring and evaluation timeframes.

▶ Agreed baseline and target measures for eHealth output and outcome indicators.

4.1 Determine national monitoring and evaluation timeframes

Objective

This step defines the timeframes for national monitoring and evaluation defined in Section 3.3. Regular monitoring and evaluation allows a government to:

▶ determine whether the action plan is delivering the expected results;

▶ identify issues and challenges affecting the delivery of results, for which corrective actions can be applied;

▶ regularly communicate the results to stakeholders, which will assist in building further momentum and support for eHealth.

Recommended outputs

This step establishes the intervals for national monitoring and evaluation. Ideally, a single set of consistent timeframes should be defined for all indicators but this may not always be possible due to the nature or requirements of a particular indicator.

Approach

Monitoring and evaluation timeframes should align with the implementation phases defined in the action plan (Figure 7).

Figure 7. Aligning national monitoring and evaluation timeframes with implementation phases
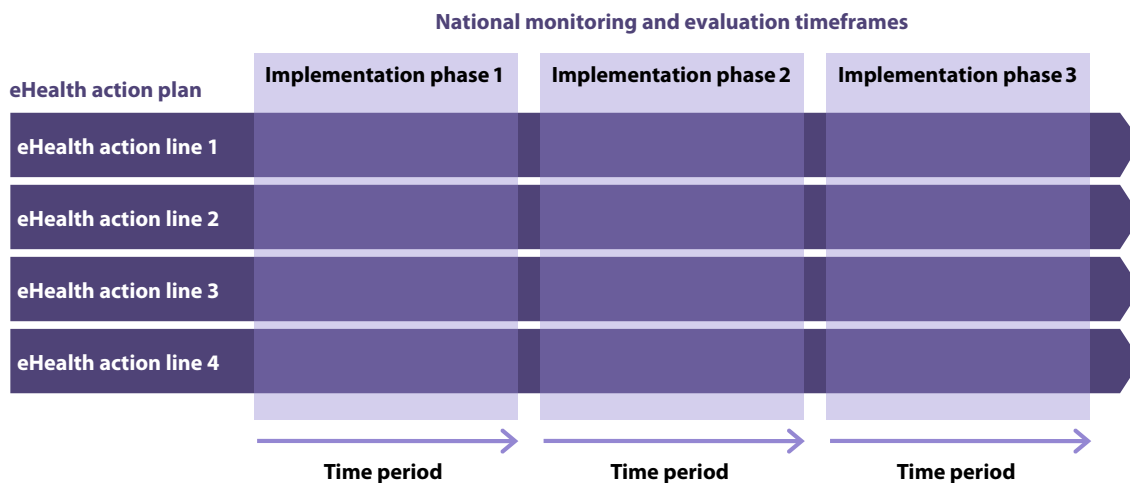
For example, a country may define a set of implementation targets that align with the strategy's three implementation horizons, which in turn lead to the definition of quantitative and qualitative implementation targets for timeframes of 3, 6 and 10 years.

While the implementation phases provide a good starting point, other factors may require using different timeframes.

▶ *Specific stakeholder requirements*, such as those related to reporting requirements that may need to be met as part of the provision of funding.

▶ *Political and funding cycles*, such as government election terms and national funding cycles which may influence when reports on the results of investing in eHealth are required.

▶ *Level and timing of eHealth implementation activity*, which in turn drives when indicators should be measured. Monitoring and evaluation timeframes have little point if nothing is expected to be delivered during them. Conversely, periods of very high eHealth activity may require closer monitoring of particular indicators.

4.2   Identify baseline measures for each indicator

Objective

This step defines the baseline measure for each eHealth output and outcome indicator. Evaluating the progress of eHealth adoption and the results flowing from this requires identification of the starting point (current status) for each indicator that will be monitored.

Recommended outputs

This step should identify baseline measures for each eHealth output and outcome indicator, which represents the value of that indicator at the start of the action plan.

Approach

This step will require research and analysis to determine baseline measures for each indicator. As a first step, it is suggested that countries determine whether their overall starting position warrants further effort in identifying a baseline measure for a particular indicator.

For example, consider a government that has defined an eHealth outcome indicator to measure 'the percentage increase in the number of primary care-related consultations conducted via telemedicine'. If that country has few or no telemedicine services in place, it may opt to define a baseline measure for this indicator as zero. A country that has already made substantial investment in telehealth, however, would need to research and identify an appropriate baseline measure to allow the results of further investment to be quantified and demonstrated.

Once it has been confirmed that a baseline measure for an indicator is required, a country will need to analyse historical data that allows a baseline measure to be calculated. If no historical data is available, the country may need to consider using a proxy source of data to infer a baseline measure for the indicator.

Examples of potential sources of historical data are shown below.

▶ Health ministries and authorities

▶ Industry and representative groups

▶ Advocacy groups

▶ Research, studies, and official publications

▶ Nongovernmental organizations (NGOs).

In practice, many countries may not have the people, processes or infrastructure in place to support the collection of data. They may need to build this capacity over time and incorporate it into the action plan.

4.3 Define target measures for eHealth output indicators

Objective

This step defines target measures for each eHealth output indicator. This allows monitoring of the adoption of eHealth. Target measures for output indicators must be defined prior to defining targets for outcome indicators, because the latter depend on the former.

Targets should be realistic and achievable in order to remain relevant and motivating.

Recommended outputs

This step should produce a set of achievable target measures for each eHealth output indicator within a given timeframe (Table 6).

Table 6. Illustrative example of target measures for eHealth output indicators

Stakeholder	eHealth output indicators	Baseline measure (%)	Target measures (%)		
			3 Years	6 Years	10 Years
Consumer	• Percentage of rural and remote communities that have access to fit-for-purpose data/telecommunications connectivity.	35	60	80	95
	• Percentage of rural and remote communities that have access to computing/access infrastructure.	5	30	50	70
	• Percentage of rural and remote communities that have been educated regarding the availability and benefits of the national telemedicine service.	0	30	50	70

Approach

This step should begin within internal analysis, though it may be extended to involve input from subject-matter experts and other health experts (Figure 8).

Figure 8. Suggested approach to defining target measures for eHealth output indicators

Internal analysis

Internal analysis should focus on drafting an initial set of targets for each output indicator. Defining targets is an estimation exercise that considers the various questions below.

▶ *Baseline measures and timeframe:* What is the starting point for this indicator and what can be realistically achieved within the monitoring timeframe?

▶ *eHealth activities:* What other activities (in the action plan) are occurring in the same timeframe and how will this influence what can be achieved?

▶ *External research:* What have other relevant national programmes achieved and what timeframes were associated with this output?

▶ *Target measures for other eHealth output indicators:* What relationships exist between eHealth output indicators, and how do target measures that have been defined for other indicators influence the targets for this indicator?

This step should also take as input the implementation targets that were defined during the development of the action plan. These targets describe, at a broad level, the targets for each implementation phase of the plan and may provide direction as to the specific targets for eHealth output indicators.

This internal activity should establish a set of draft targets for eHealth output indicators, supported by rationale as to why these measures represent achievable adoption targets.

Input from subject-matter experts and multi-sector stakeholders

Subject-matter experts and stakeholders can provide insight into achievability of the draft targets measures for output indicators through knowledge of:

▶ similar initiatives or change programmes, and the outcomes that these were able to deliver;

▶ the particular risks, challenges and barriers to adoption of eHealth;

▶ other national or international programmes, initiatives or events that may influence the adoption of eHealth in the country.

The draft indicators should be reviewed in consultation with relevant subject matter experts and multi-sector stakeholders to refine the targets and ensure that the rationale is sound.

4.4   Define target measures for eHealth outcome indicators

Objective

This step defines targets for each eHealth outcome indicator across the previously-defined timeframes. These targets allow the evaluation of the results for stakeholders.

The targets set for the eHealth outcome indicators should accurately reflect the results that can be realized given the target rates of eHealth adoption. Targets should be ambitious but realistic.

Recommended outputs

This step should produce a set of targets for each eHealth outcome indicator across the previously defined timeframes (Table 7).

Table 7. Example of target measures for eHealth outcome indicators

Stakeholder	eHealth outcome indicators	Baseline measure (%)	Target measures (%)		
			3 Years	6 Years	10 Years
Consumers	• Percentage increase in the number of primary care-related consultations conducted via telemedicine.	0	20	40	50
	• Percentage increase in the number of rural and remote consumers that can gain access to primary care services via telemedicine.	0	30	50	70

Approach

The process for identifying targets for outcome indicators is similar to that used for output indicators to identify target measures for eHealth output indicators.

Internal analysis

Internal analysis should focus on drafting an initial set of targets for each eHealth outcome indicator by considering the questions below.

- ► *Related eHealth output indicators:* What results can be achieved given the targets that have been defined for related output indicators?

- ► *Baseline eHealth outcome indicator measures:* What is the country's starting point in terms of the tangible results that are to be measured? Are there results already delivered that need to be accounted for?

- ► *Monitoring and evaluation timeframes:* What results can realistically be achieved within the monitoring and evaluation timeframe?

This internal activity should establish a set of draft target measures for eHealth outcome indicators which will reflect the tangible results that can be expected, given the rates of adoption of eHealth anticipated.

Input from subject-matter experts and multi-sector stakeholders

Subject-matter experts and stakeholders can provide insight into the potential to realize tangible results for stakeholders, given the levels of eHealth adoption anticipated and targeted by the eHealth output indicators.

Consideration should be given to the questions below.

- ► Given the level of adoption of an eHealth service or solution, what do they anticipate that will mean in terms of delivering health services to the population?

- ► Given the change in the ability to deliver health services, what does that mean in terms of patient outcomes?

- ► Is the proposed target realistic, given the level of adoption anticipated?

The draft list of indicators and rationale should be reviewed with relevant subject-matter experts and stakeholders.

CHAPTER 5
Define supporting governance and processes

This stage focuses on defining the national governance and processes for monitoring and evaluating the results of implementing the eHealth action plan.

Indicators   **Measures**   **Governance**

Define indicators for eHealth	Define baseline and target measures for indicators	Define supporting governance and processes

Objective

This stage defines the governance and processes through which the actors and levels are all brought together for monitoring and evaluation of eHealth.

Activities

▶ Define a governance model for national monitoring and evaluation.

▶ Define a process for it.

Outputs

▶ Governance model for national monitoring and evaluation.

▶ High-level process for undertaking it.

5.1 Define a governance model for national monitoring and evaluation

Objective

This step defines a governance model for national monitoring and evaluation of the adoption of eHealth and the tangible results flowing from this. This model should describe the governance functions and structure within which national monitoring and evaluation will be undertaken.

Monitoring and evaluation is typically an effort performed by various parties. A governance model provides the structure by which these collective efforts are aligned.

The governance model is distinct from the broader programme management function, which provides overall governance and oversight of the execution of the eHealth plan. Monitoring and evaluation of eHealth adoption and associated results is a specialized role that is typically separate from broader programme management, yet it also complements it. This also ensures an independent perspective on programme progress.

A governance model consists of a range of functions and the required mechanisms to deliver them (Table 8).

Table 8. Example functions for governing national monitoring and evaluation

Function	Purpose	Responsible Party
Monitoring oversight and steering	Provide executive-level oversight in regard to national monitoring and reporting (i.e. input, escalation, review and endorsement of deliverables).	Health Department – departmental executive committee
Project management	Provide overall management of national monitoring and reporting functions (i.e. planning and scheduling, progress monitoring, financials, risk management).	Health Department – performance management business unit
National indicator development	Develop national eHealth output and outcome indicators to enable monitoring of the delivery of the eHealth action plan, and through doing so, the national eHealth vision.	Health Department – performance management business unit
National measures definition	Define national baseline and target measures for eHealth output and outcome indicators, against which national progress can be measured.	Health Department – performance management business unit
National capability development	Develop national monitoring processes and supporting frameworks, tools and templates, and the communication and education of others regarding these processes and timelines.	Health Department – performance management business unit
Activity monitoring and evaluation	Define activity-specific indicators and targets aligned to national indicators and targets, and the subsequent monitoring and reporting of these.	Health Department–performance management business unit
Health sector monitoring and evaluation	Define health-sector-specific indicators and targets (if required) aligned to national indicators and targets, and the subsequent monitoring and reporting of these.	Health Department–performance management business unit Public and private care providers
Non-health sector monitoring and evaluation	Define broader non-health sector indicators and targets (if required) aligned to national indicators and targets, and their monitoring and reporting.	Health Department–eHealth programme management office Non-health-sector infrastructure and service providers
National analysis and evaluation	Collate and analyse activity, health sector and non-health-sector reporting to report against national indicators and targets, and identify where corrective actions may be required.	Cross-sector coordination authority or committee

Function	Purpose	Responsible Party
Expert support	Provide expert support in the monitoring, analysis and evaluation of eHealth adoption and the tangible results of this adoption.	Health Department – subject–matter experts Third-party organizations NGOs International agencies (WHO, ITU, etc.)
Research	Provide broader research and analytical capabilities to support monitoring and reporting of eHealth, potentially through the provision of data and insights from other national and international eHealth programmes.	Health Department–research and policy units External research organizations International agencies (WHO, ITU, etc.)

Recommended outputs

The step should produce a definition of the governance model required to monitor and evaluate eHealth. It should identify and describe:

▶ the governance mechanisms required

▶ the structure and relationships between them.

A governance mechanism is a committee, council, team or special group that has the mandate or responsibility to perform one or more of the functions described. The composition of a governance mechanism should be the best available to carry out this mandate or responsibility (Figure 9).

Figure 9. Sample governance model for national monitoring and evaluation
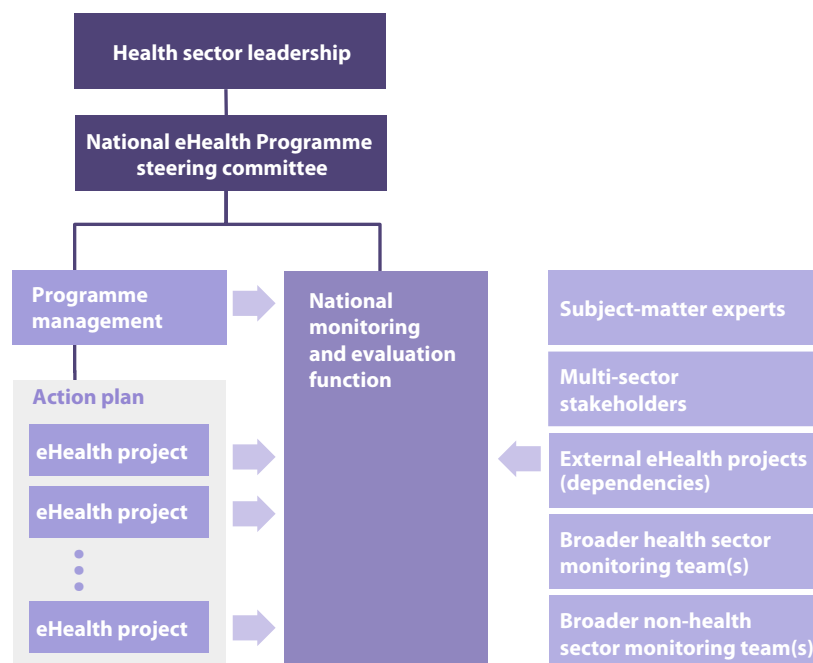
In the above example, the responsibility for monitoring and evaluation at a national level belongs to the *national monitoring and evaluation function*. This complements programme management, and provides an independent view of eHealth adoption and associated results to the programme steering committee. This function could be implemented as a new organizational group, or could sit within an existing government entity or eHealth agency. Alternatively, it could be contracted to a professional services firm.

Individual eHealth projects, including external projects on which the action plan is dependent, are responsible for monitoring their own progress within the overall national framework. External projects include those undertaken outside the scope of the national action plan (Table 9).

The framework enables the rolling up of project level performance into the defined output and outcome indicators.

Table 9. Role of governance mechanisms as they relate to national monitoring and evaluation

Mechanism	Responsibilities
Health sector leadership	• Acting as the vocal and visible champion of the national eHealth work programme • Accountable for the delivery of national eHealth adoption and associated results

National eHealth programme steering committee	• Provides monitoring and evaluation oversight and steering, which includes:
	  − Providing guidance and input to definition of national indicators, measures, and monitoring and evaluation timeframes
	  − Reviewing and endorsing national indicators, measures, and monitoring and evaluation timeframes
	  − Assisting in resolving risks, issues and conflicts related to monitoring and evaluation
	  − Reviewing and endorsing recommendations on corrective actions to the programme to address divergences between actual and target targets
	  − Ensuring targets are being achieved and that corrective actions are being made to the eHealth work programme to resolve divergences.

Programme management	• Ensuring monitoring and evaluation processes and tools are aligned and integrated with broader programme management processes and tools • Working with the *national monitoring and evaluation function* to identify options for taking corrective action to address divergences between actual and target indicator measures • Undertaking corrective actions that have been endorsed by the programme steering committee
National monitoring and evaluation function	• Project management (i.e. day–to–day management of activities, progress, financials, risks and issues) • Development of national eHealth output and outcome indicators • Development of baseline and target measures • Liaising with subject matter experts and stakeholders to gain input into the definition of indicators and baseline/target measures for indicators • Confirm indicators, and associated baseline and targets, with decision-makers • Develop and communicate processes, schedules, templates, etc., for the operation of the national monitoring and evaluation process • Collate and analyse activity, health-sector and non-health-sector reporting to assess against national indicators and targets, and identify where corrective actions may be required • Develop recommendations regarding corrective actions, and advise the programme steering committee (Note: The national monitoring and evaluation function does not have accountability for correcting programme actions) • Provide expert support in the monitoring, analysis and evaluation of eHealth adoption and associated results • Provide broader analytical capabilities to support monitoring and evaluation, including the provision of data and insights from other national programmes
Subject matter experts	• Provide input into the definition of and insights into the achievability of the draft target measures for indicators • Provide input into corrective actions that may be appropriate to address divergence
Multi-sector stakeholders	• Provide input into the definition of and insights into the achievability of the draft target measures for indicators • Provide input into corrective actions that may be appropriate to address divergence
eHealth project team	• Define eHealth output and outcome indicators and targets aligned to national indicators and targets • Undertake monitoring and evaluation of activity-level indicators • Report on activity-level indicators to the *national monitoring and evaluation function* in accordance with defined processes, schedules, templates and tools

Mechanism	Responsibilities
External eHealth projects on which the action plan is dependent	• Define eHealth output and outcome indicators and targets aligned to national indicators and targets • Undertake monitoring and evaluation of activity-level indicators • Report on activity-level indicators to the *national monitoring and evaluation function* in accordance with defined processes, schedules, templates and tools
Broader health-sector monitoring team(s)	• Same as per *External eHealth projects* except that their focus is on the eHealth outputs and outcomes within a particular part or segment of the country's health sector
Broader non-health-sector monitoring team(s)	• Same as per *External eHealth projects* except that their focus is on the adoption eHealth outputs and outcomes in other sectors (e.g. ICT industry), and broader social and economic development linked to eHealth

Approach

A suggested approach for defining a governance model for national monitoring and evaluation involves a number of steps.

▶ Confirming the functions required

▶ Identifying existing governance mechanisms that could be used, based on:

- *mandate:* the scope of responsibilities officially given to that governance mechanism;

- *external perception:* the perception of that governance mechanism within the wider health sector, which enables that mechanism to perform its role;

- *engagement and influence:* the ability of that mechanism to engage with, influence and consult with stakeholders;

- *internal capabilities:* the capability of that mechanism to fulfill its responsibilities.

▶ Defining a pragmatic governance model that will deliver the required governance functions, taking into account the existing governance mechanisms that can be used, and new mechanisms that need to be developed to address gaps. The role and responsibilities of each governance mechanism, and the nature of the relationships and interactions between them, also need to be clearly defined.

5.2   Define a process for national monitoring and evaluation

Objective

This step defines the national monitoring and evaluation process. It will be an ongoing process, in the background of the implementation programme, with monitoring and evaluation undertaken at the agreed timeframes for each of the indicators.

It is not the focus of this step to define detailed processes that will occur at the eHealth activity level, such as within specific initiatives and projects in the action plan. The specific monitoring and evaluation processes for eHealth activities should be aligned with the national approach (Table 10).

Recommended outputs

This step should produce a description of the national process for monitoring and evaluation of eHealth during the implementation of the action plan, including the governance required to ensure that it will be done (Figure 10).

Figure 10. Example of a national monitoring and evaluation process

Approach
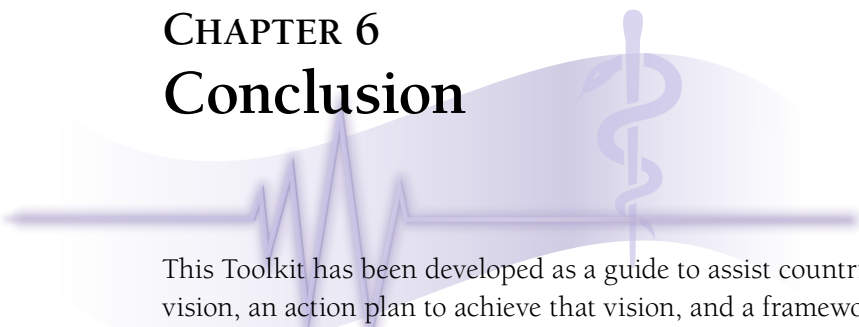
Defining a pragmatic monitoring and evaluation process is a complex undertaking, particularly for large-scale eHealth programmes in which many parties will be involved.

Table 10. Example of national- and activity-level monitoring and evaluation activities

Process	National-level (non-exhaustive)	Activity-level (non-exhaustive)
Planning and initiation	• Define and communicate national evaluation schedule and milestones • Develop and communicate national monitoring and evaluation frameworks, tools and templates • Provide advice and support to activity-level teams in defining appropriate indicators and targets that support national-level indicators and targets	• Establish local monitoring and evaluation roles and responsibilities • Define detailed monitoring and evaluation timelines and milestones that align with national timings • Develop and deploy detailed monitoring and evaluation procedures, tools and templates that align with national requirements • Define detailed indicators that support measurement of national indicators • Define target measures that support national targets • Define indicator measurement approaches
Execution and measurement	• Provide advice and expertise to activity-level teams on developing indicator measures to assess current performance	• Collect measurement data while activity is being undertaken • Develop and track current indicator measures • Identify and resolve issues in developing current indicator measures
Progress analysis and reporting	• Collate activity-level reports on actual versus target performance for indicators • Liaise with activity-level teams to explore performance and understand causes of divergences • Develop reports that describe actual versus target performance for national-level indicators • Identify causes of divergences in actual and target performance at the national level	• Develop reports that describe actual versus target performance for activity-level indicators • Identify causes of divergences in actual and target performance at the activity level
Corrective action planning	• Liaise with activity-level teams to understand corrective actions that can be taken to address activity-level and programme-level divergences • Identify and assess programme-level corrective actions to address divergences in actual and target performance at the national level • Assess impact, costs and risks of implementing programme-level corrective actions • Review and gain endorsement programme-level corrective actions with the programme steering committee • Manage changes in the scope of national programme (if required) to implement corrective actions	• Identify local actions that can be taken to address divergences in actual and target performance for activity-level indicators • Identify programme-level actions that can be taken to address divergences in actual and target performance for activity-level indicators • Assess impact, costs and risks of implementing local and programme-level actions for the activity in question • Manage changes in scope (if required) to implement corrective actions
Refinement	• Identify national target measures for indicators that may be unrealistic or unachievable within the required timeframe • Liaise with activity-level teams to understand changes to activity-level targets • Understand implications on national level target measures for indicators • Develop revised national target measures for indicators • Review and gain endorsement of revised national target measures with the programme steering committee	• Identify activity target measures for indicators that may be unrealistic or unachievable within the required timeframe • Refine target measures for indicators to be realistically achievable • Agree changed target measures for indicators for future monitoring periods

CHAPTER 6
Conclusion

This Toolkit has been developed as a guide to assist countries to develop a national eHealth vision, an action plan to achieve that vision, and a framework by which results can be monitored and evaluated. Like all strategies and plans, the outcomes of this Toolkit are not static and represent a point-in-time understanding of what a country needs to achieve in order to address its particular goals and challenges. For example, the various eHealth visions, strategies and plans that are referenced in Annex C represent a point-in-time view for each of the countries that developed them.

Changes in a country's strategic context will require a dynamic approach to updating the vision for eHealth and the associated action plan so that they remain relevant. This requires understanding the key triggers for refreshing the vision and action plan, whether they be specific events that change a nation's strategic context for eHealth or a defined period of time after which a revision is required.

Ongoing engagement with essential health and non-health stakeholders must also be maintained. Success in implementing a national eHealth vision is heavily dependent on having the continued support and guidance of stakeholders, and thus does not stop after a national strategy has been developed.

Continued communication is also vital. Part 3 has emphasized that stakeholders should be regularly informed of the progress of the programme, and in particular, any impacts or results arising from implementation. This ensures transparency, which is essential in maintaining stakeholder support and momentum for further activity and investment in eHealth.

Annex A
Results-based management

Results-based management (RBM) has become increasingly important for the United Nations and its specialized agencies as they have sought to improve their ability to respond to new demands within the limits of resource constraints, and to demonstrate that they have delivered on expectations. It is also of direct relevance to the establishment of monitoring and evaluation for a national eHealth programme.

The goal of RBM

The goal of results-based management is to shift managerial and administrative emphasis from a process-focused approach to one based on performance and results (outcomes). It is a management strategy that focuses on performance and achievement of outputs, outcomes and impacts. Organizations and programmes that apply results-based management seek to:

▶ focus the organization or programme efforts and resources on expected results

▶ improve the effectiveness and sustainability of operations (or programme activities)

▶ improve accountability for resources used.

Key concepts in RBM

Figure 11 below highlights the key concepts in RBM, and lays out a logical framework in which to guide the planning and execution of a results-based management approach.

Figure 11. Logical framework for results-based management
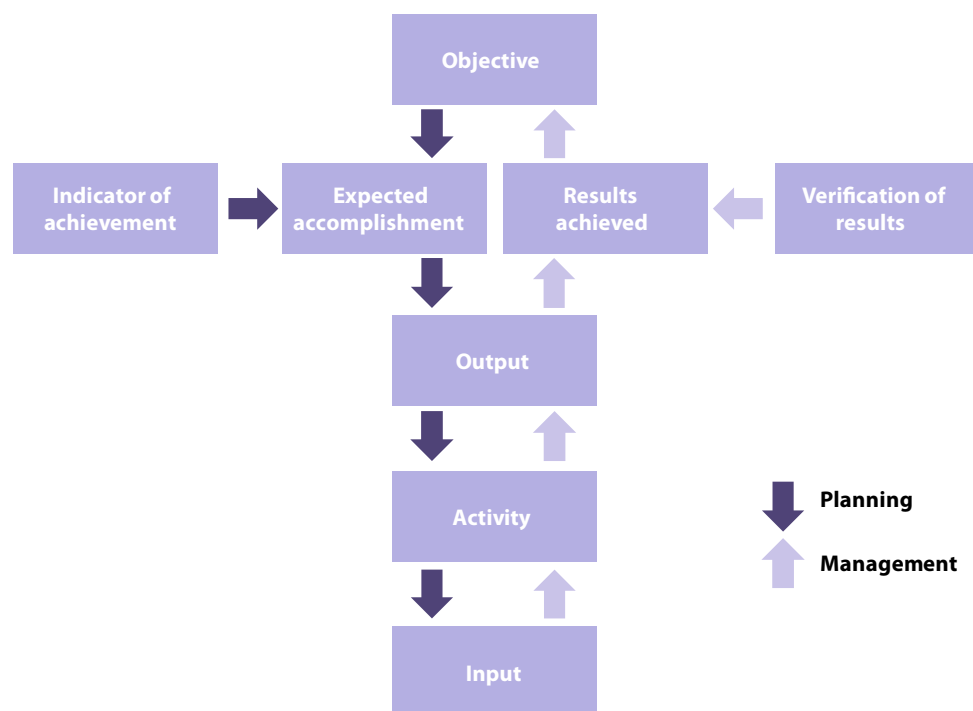
Results-based management is both a planning process from the top down and a management process in the reverse direction. Planning starts with defining objectives – future end-states, deciding what accomplishments are expected if the objective is to be achieved, determining which outputs will lead to those accomplishments, defining the activities necessary to produce those outputs and, finally, identifying the inputs that are necessary to carry out the activities.

The management process is exactly the opposite. The inputs are acquired and deployed to carry out the activities, the activities lead to the production of outputs and, if they are well designed and executed, the output will lead to the expected accomplishments (or expected results) (Table 11).

Table 11. Monitoring and evaluation concepts

Concept	Meaning
Objective	An overall desired achievement involving a process of change aimed at meeting certain needs of identified end-users within a given period of time (i.e. is the situation that would be observed at the end of a specific period).
Expected accomplishment	A desired outcome involving benefits to end-users, expressed as a quantitative or qualitative standard, value or rate. The direct consequence or effect of the generation of outputs leads to the fulfilment of a certain objective. It is a change that can be observed to have taken place. It is something that has to happen if an objective is to be achieved.
Indicator of achievement	The measures of whether and/or the extent to which the objectives and/or expected accomplishments have been achieved. They correspond either directly or indirectly to the objective or the expected accomplishment for which they are used to measure performance. All results should have a corresponding indicator of achievement.
Results achieved	The actual outcome that delivers benefits to end-users, expressed as a quantitative or qualitative standard, value or rate. It describes what has actually been achieved.
Verification of results	The actual measures that demonstrate that a particular result has been achieved.
Output	Tangible products or services delivered by a programme to end-users in order to induce outcomes. Outputs are produced by activities.
Activity	An action taken to transform inputs into outputs.
Input	Personnel and other resources necessary for producing outputs and achieving accomplishments. Inputs are the objects of expenditure that are used to undertake activities.

Monitoring and evaluation in RBM

Monitoring and evaluation – or M&E as it sometimes called – is an integral part of RBM:

▶ monitoring is the continuing function of collecting data indicating the extent of progress and achievement of objectives, and progress in the use of allocated funds;

▶ evaluation is the process that seeks to determine as systematically and objectively as possible the relevance, effectiveness and impact of an activity in light of its goals, objectives and accomplishments.

The focus of M&E is best demonstrated by understanding its relationship to the key concepts that were introduced in the previous section (Figure12).

Figure 12. Relationship of monitoring and evaluation to the results chain
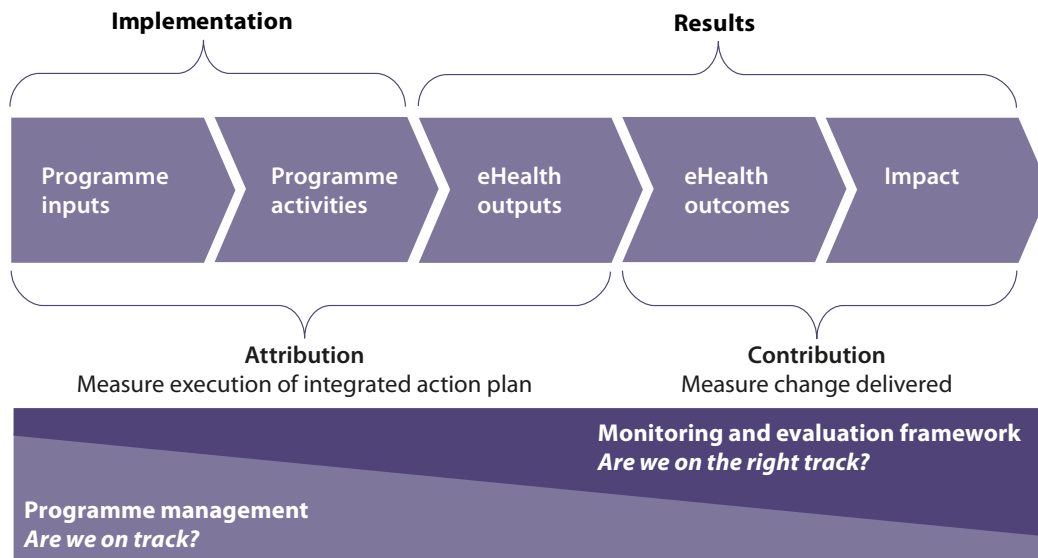
Monitoring primarily focuses on implementation and the measurement of execution. Evaluation primarily focuses on measuring the change and impact that implementation has had in terms of the objectives and results that were originally sought.

An effective M&E programme requires the following:

▶ understanding the expected accomplishments of the eHealth programme;

▶ ensuring that expected accomplishments can really be evaluated;

▶ reviewing performance indicators to ensure that they are pragmatic, simple and achievable;

▶ determining when the programme will be evaluated, which may be at specific times in the programme or at other key events in the programme (e.g., problem is perceived, results are supposed to have happened);

▶ planning for the collection of information to support evaluation, including:

  • data sources

  • collection method

  • baseline data for performance indicators

  • time required for collection

  • responsible organization/personnel;

▶ collecting and analysing evaluation data, and drawing appropriate conclusions;

▶ developing recommendations (including corrective actions) and lessons learned.

ANNEX B
Examples of eHealth strategies

A number of countries have made their eHealth Strategies or eHealth Roadmaps publicly available via the Internet. The table below lists a selection of these publications as examples of how different countries have documented their eHealth Strategies and Roadmaps. However, it should be noted all of these pre-date this Toolkit's development, and therefore none of them has been developed using the Toolkit's proposed approach.

Table 12. Examples of eHealth strategies

Country	Type	Link	Published
Australia	National eHealth Strategy	http://www.health.gov.au/internet/main/publishing.nsf/content/national+Ehealth+strategy	September 2008
Australia	State eHealth Strategy – Queensland	http://www.health.qld.gov.au/ehealth/docs/eh_strat_public.pdf	September 2006
Denmark National Board of Health	National IT Strategy 2003–2007 for the Danish Health Care Service National Strategy for the Digitalisation of the Danish Healthcare Service 2008–2012	http://www.sst.dk/publ/Publ2004/National_IT_strategy.pdf http://www.epractice.eu/en/library/310063	2003 2007
European Commission, DG Information Society and Media, ICT for Health Unit	European countries on their journey towards national eHealth infrastructures, evidence on progress and recommendations for cooperation actions, Brussels, Belgium	http://www.ehealthnews.eu/publications/latest/2494--european-countries-on-their-journey-towards-national-ehealth-infrastructures	January 2011
European Commission, DG Information Society and Media, ICT for Health Unit	eHealth priorities and strategies in European countries	http://ec.europa.eu/information_society/activities/health/docs/policy/ehealth-era-full-report.pdf	2007
European Commission	Repository of eHealth strategies and priorities for EU Member States	http://www.ehealth-era.org/database/database.html	N/A
Finland Ministry of Social Affairs and Health	eHealth Roadmap – Finland	http://www.stm.fi/en/publications/publication/_julkaisu/1056833	2007
Kenya	National eHealth Strategy	http://svn.who-mahler.net/hci-content/ethiopia/lib/exe/fetch.php?media=workshops:ethiopia:kenya_final_national_ehealth_strategy_2011-2017_.pdf	2011
Mauritius	National eHealth Strategy: He@lth2015, Seamless Continuity of Care	http://www.gov.mu/portal/goc/moh/file/plan.pdf	2010
Saudi Arabia	National eHealth Strategy	http://www.moh.gov.sa/en/Ministry/nehs/Pages/default.aspx	2011
Scotland	National eHealth Strategy	http://www.scotland.gov.uk/Publications/2011/09/09103110/9	September 2011
Sweden	National Strategy for eHealth	http://sweden.gov.se/sb/d/574/a/64324	2006

Country	Type	Link	Published
Switzerland **BAG/National Ministry of Health**	Toward one national e-health strategy	http://www.hpm.org/en/Surveys/USI_-_Switzerland/11/Toward_one_national_e-health_strategy.html	2007
	Switzerland Country Brief: eHealth Strategies	http://ehealth-strategies.eu/database/documents/Switzerland_CountryBrief_eHStrategies.pdf	2010
United States of America	Federal Health IT Strategic Plan	http://healthit.hhs.gov/portal/server.pt?open=512&objID=1211&parentname=CommunityPage&parentid=2&mode=2	March 2011

N/A, not applicable.

ANNEX C
Definition of terms used in the Toolkit

Part	Term	Definition
Part I: **Establishing a national eHealth vision**	Strategic goals and challenges	Strategic health sector goals and challenges and/or other national development goals that can be best supported by eHealth. While there may be many different health sector goals and challenges, only some of these can be directly supported by eHealth and where a national eHealth vision will have the most impact.
	eHealth outcomes	What will be achieved or changed through using eHealth, and how will the health system and services change by: • Improving the information flows within the health sector • Improving electronic access to health services and information.
	eHealth vision	High-level statement that describes the strategic benefits and outcomes for the country in general or for the health system and population through the strategic changes to health system and services introduced by eHealth (eHealth outcomes).
	National eHealth environment	The national eHealth environment is made up of eHealth components representing the enabling and foundation elements for eHealth as well as technical capabilities that form together an 'ecosystem' for eHealth in a country.
	eHealth components	The building blocks of a national eHealth environment, which will allow the eHealth outcomes to be achieved. They describe what is needed to be introduced or strengthened to achieve the eHealth vision in terms of: • leadership and governance • strategy and investment • services and applications • infrastructure • standards and interoperability • legislation, policy and compliance • workforce.
	Strategic recommendations	Strategic recommendations describe the high–level actions required to deliver the national eHealth environment. These actions may describe how new eHealth components will be delivered, or how existing eHealth components will be repurposed or extended
Part II: **Developing an eHealth action plan**	Action Lines	Broad areas to group national activities of similar focus and intent that are required to deliver a nation's eHealth vision
	eHealth Outputs	The specific achievements, deliverables, results or changes required to deliver a strategic recommendation
	Activities	The set of activities that need to be undertaken to deliver a particular output
Part III: **National eHealth monitoring and evaluation guidelines**	Output indicators	Indicators that provide insights into the adoption and take-up of eHealth within the country's health sector
	Outcome indicators	Indicators that provide insights into the tangible results for stakeholders that arise from the adoption and use of eHealth

World Health Organization

ITU

Worldwide, the application of information and communication technologies to support national health-care services is rapidly expanding and increasingly important. This is especially so at a time when all health systems face stringent economic challenges and greater demands to provide more and better care, especially to those most in need.

The *National eHealth Strategy Toolkit* is an expert, practical guide that provides governments, their ministries and stakeholders with a solid foundation and method for the development and implementation of a national eHealth vision, action plan and monitoring framework. All countries, whatever their level of development, can adapt the Toolkit to suit their own circumstances.

Representing one of the most significant collaborations in recent years between the World Health Organization and the International Telecommunication Union, the Toolkit is a landmark in understanding what eHealth is, what it can do, and why and how it should be applied to health care today.

Cover art: base map made with Natural Earth;
illustration by Marilyn Langfeld