National eHealth Strategy Toolkit

PART 1

Establishing a National eHealth Vision
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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.

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.
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Chapter 1
National context for eHealth

1.1 The case for eHealth

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. 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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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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Table 1. Examples of the impact of eHealth

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Impact of eHealth</th>
</tr>
</thead>
</table>
| 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).

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

<table>
<thead>
<tr>
<th>Context</th>
<th>Characteristics</th>
</tr>
</thead>
</table>
| 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

<table>
<thead>
<tr>
<th>Context</th>
<th>Example focus</th>
<th>Example actions</th>
</tr>
</thead>
</table>
| 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**
The components can be grouped into the ICT environment and the enabling environment (Table 4).

**Table 4. Role of eHealth components**

<table>
<thead>
<tr>
<th>Component</th>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership, governance and multi-sector engagement</td>
<td>Enabling environment</td>
<td>• Direct and coordinate eHealth at the national level; ensure alignment with health goals and political support; promote awareness and engage stakeholders.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use mechanisms, expertise, coordination and partnerships to develop or adopt eHealth components (e.g. standards).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Support and empower required change, implementation of recommendations and monitoring results for delivery of expected benefits.</td>
</tr>
<tr>
<td>Strategy and investment</td>
<td>Enabling environment</td>
<td>• Ensure a responsive strategy and plan for the national eHealth environment. Lead planning, with involvement of major stakeholders and sectors.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Align financing with priorities; donor, government and private-sector funding identified for medium term.</td>
</tr>
<tr>
<td>Legislation, policy and compliance</td>
<td>Enabling environment</td>
<td>• Adopt national policies and legislation in priority areas; review sectoral policies for alignment and comprehensiveness; establish regular policy reviews.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Create a legal and enforcement environment to establish trust and protection for consumers and industry in eHealth practice and systems.</td>
</tr>
<tr>
<td>Workforce</td>
<td>Enabling environment</td>
<td>• Make eHealth knowledge and skills available through internal expertise, technical cooperation or the private sector.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Build national, regional and specialized networks for eHealth implementation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Establish eHealth education and training programmes for health workforce capacity building.</td>
</tr>
<tr>
<td>Standards and interoperability</td>
<td>Enabling environment</td>
<td>• Introduce standards that enable consistent and accurate collection and exchange of health information across health systems and services.</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>ICT environment</td>
<td>• 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.</td>
</tr>
<tr>
<td>Services and applications</td>
<td>ICT environment</td>
<td>• 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.</td>
</tr>
</tbody>
</table>
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

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.

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

![Sample governance model](image-url)
Table 5. Examples of governance functions, responsibilities and composition

<table>
<thead>
<tr>
<th>Group</th>
<th>Responsibilities</th>
<th>Composition</th>
</tr>
</thead>
</table>
| 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

<table>
<thead>
<tr>
<th>Stage</th>
<th>Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manage the process</td>
<td>1</td>
</tr>
<tr>
<td>Engage with stakeholders</td>
<td>2</td>
</tr>
<tr>
<td>Establish the strategic context</td>
<td>3</td>
</tr>
<tr>
<td>Learn from eHealth trends</td>
<td>4</td>
</tr>
<tr>
<td>Draft an initial vision</td>
<td>5</td>
</tr>
<tr>
<td>Identify required components</td>
<td>6</td>
</tr>
<tr>
<td>Gather information on the eHealth environment</td>
<td>7</td>
</tr>
<tr>
<td>Assess opportunities and gaps</td>
<td>8</td>
</tr>
<tr>
<td>Refine vision and develop recommendations</td>
<td>9</td>
</tr>
</tbody>
</table>

- **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.

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

<table>
<thead>
<tr>
<th>Market</th>
<th>Description</th>
<th>Implications for planning</th>
</tr>
</thead>
</table>
| 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

Table 7. Stakeholder roles in a national vision

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision-makers</td>
<td>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.</td>
<td>• National eHealth steering committee</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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).</td>
</tr>
<tr>
<td>Key influencers</td>
<td>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.</td>
<td>• Senior executives in key health organizations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Senior executives in funding and investment organizations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Eminent academics and experts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Other advisers to steering committee members and other relevant government committees and councils</td>
</tr>
<tr>
<td>Engaged stakeholders</td>
<td>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.</td>
<td>• Members of advocacy groups (e.g. privacy, public, vendors, industry, unions, etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Patient associations and advocacy groups</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Health agency executives (e.g. NGOs, hospitals, etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Health committees and programmes</td>
</tr>
<tr>
<td>Broader stakeholders and general public</td>
<td>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.</td>
<td>• Individuals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Carers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Families</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Community groups</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Role</th>
<th>Approach to engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision-makers</td>
<td>Frequent and formal contact to seek input, and guidance, present material for final review, and seek acceptance and endorsement of recommendations.</td>
</tr>
<tr>
<td>Key influencers</td>
<td>Frequent and more informal contact to seek input and guidance and assistance in forming key directions and recommendations.</td>
</tr>
<tr>
<td>Engaged stakeholders</td>
<td>Initial consultation followed up with structured outward communications at appropriate intervals to advise on process and outcomes.</td>
</tr>
<tr>
<td>Broader stakeholders and general public</td>
<td>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.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Stage</th>
<th>Key influencers</th>
<th>Decision-makers</th>
<th>Broader stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish the strategic context for national eHealth vision</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A, not applicable</td>
</tr>
<tr>
<td></td>
<td>Consulted to gather input required to develop the strategic context for national eHealth.</td>
<td>Consulted to develop the strategic context for national eHealth.</td>
<td>Consulted to develop the strategic context for national eHealth.</td>
</tr>
<tr>
<td>Construct an initial vision for national eHealth</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A, not applicable</td>
</tr>
<tr>
<td></td>
<td>Consulted to provide input into initial national eHealth vision.</td>
<td>Consulted to provide input into initial national eHealth vision.</td>
<td>Consulted to provide input into initial national eHealth vision.</td>
</tr>
<tr>
<td>Identify the required eHealth components</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A, not applicable</td>
</tr>
<tr>
<td></td>
<td>Consulted to identify international jurisdictions and projects that should be considered or endorses strategic planning activities.</td>
<td>Consulted to identify international jurisdictions and projects that should be considered or endorses strategic planning activities.</td>
<td>Consulted to identify international jurisdictions and projects that should be considered or endorses strategic planning activities.</td>
</tr>
<tr>
<td>Gather information about the current eHealth environment</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A, not applicable</td>
</tr>
<tr>
<td></td>
<td>Consulted as part of the assessment of existing or planned eHealth components within the nation's current eHealth environment.</td>
<td>Consulted as part of the assessment of existing or planned eHealth components within the nation's current eHealth environment.</td>
<td>Consulted as part of the assessment of existing or planned eHealth components within the nation's current eHealth environment.</td>
</tr>
<tr>
<td>Assess the current state of eHealth for gaps, barriers and resiliency</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A, not applicable</td>
</tr>
<tr>
<td></td>
<td>Consulted as part of assessing existing or planned eHealth components within the nation's current eHealth environment.</td>
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<td>Consulted as part of assessing existing or planned eHealth components within the nation's current eHealth environment.</td>
</tr>
<tr>
<td>Refine vision and develop strategic recommendations</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A, not applicable</td>
</tr>
<tr>
<td></td>
<td>Consulted to provide input and guidance to the development of strategic recommendations.</td>
<td>Consulted to provide input and guidance to the development of strategic recommendations.</td>
<td>Consulted to provide input and guidance to the development of strategic recommendations.</td>
</tr>
</tbody>
</table>

**Table 9. Sample stakeholder consultation plan**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Key influencers</th>
<th>Decision-makers</th>
<th>Broader stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish the strategic context for national eHealth vision</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A, not applicable</td>
</tr>
<tr>
<td></td>
<td>Consulted to gather input required to develop the strategic context for national eHealth.</td>
<td>Consulted to develop the strategic context for national eHealth.</td>
<td>Consulted to develop the strategic context for national eHealth.</td>
</tr>
<tr>
<td>Construct an initial vision for national eHealth</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A, not applicable</td>
</tr>
<tr>
<td></td>
<td>Consulted to provide input into initial national eHealth vision.</td>
<td>Consulted to provide input into initial national eHealth vision.</td>
<td>Consulted to provide input into initial national eHealth vision.</td>
</tr>
<tr>
<td>Identify the required eHealth components</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A, not applicable</td>
</tr>
<tr>
<td></td>
<td>Consulted to identify international jurisdictions and projects that should be considered or endorses strategic planning activities.</td>
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</tr>
<tr>
<td>Gather information about the current eHealth environment</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A, not applicable</td>
</tr>
<tr>
<td></td>
<td>Consulted as part of the assessment of existing or planned eHealth components within the nation's current eHealth environment.</td>
<td>Consulted as part of the assessment of existing or planned eHealth components within the nation's current eHealth environment.</td>
<td>Consulted as part of the assessment of existing or planned eHealth components within the nation's current eHealth environment.</td>
</tr>
<tr>
<td>Assess the current state of eHealth for gaps, barriers and resiliency</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A, not applicable</td>
</tr>
<tr>
<td></td>
<td>Consulted as part of assessing existing or planned eHealth components within the nation's current eHealth environment.</td>
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<td>Consulted as part of assessing existing or planned eHealth components within the nation's current eHealth environment.</td>
</tr>
<tr>
<td>Refine vision and develop strategic recommendations</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A, not applicable</td>
</tr>
<tr>
<td></td>
<td>Consulted to provide input and guidance to the development of strategic recommendations.</td>
<td>Consulted to provide input and guidance to the development of strategic recommendations.</td>
<td>Consulted to provide input and guidance to the development of strategic recommendations.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Round</th>
<th>Focus of engagement and consultation</th>
<th>Proposed mechanism</th>
</tr>
</thead>
</table>
| 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

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Sample questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size and demographics</td>
<td>• What is the size and age distribution of the current population?</td>
</tr>
<tr>
<td></td>
<td>• 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)?</td>
</tr>
<tr>
<td></td>
<td>• How are these various segments expected to change?</td>
</tr>
<tr>
<td>Current health outcomes</td>
<td>• What are current health outcomes, such as:</td>
</tr>
<tr>
<td></td>
<td>- average life expectancy</td>
</tr>
<tr>
<td></td>
<td>- mortality rates and causes</td>
</tr>
<tr>
<td></td>
<td>- primary diseases and risk factors, particularly affecting poorer populations</td>
</tr>
<tr>
<td></td>
<td>- other important national and international health measures</td>
</tr>
<tr>
<td>Implications of</td>
<td>• What demographic changes are forecast to occur?</td>
</tr>
<tr>
<td>demographic trends</td>
<td>• What challenges will these changes create for the health system?</td>
</tr>
<tr>
<td>Implications of</td>
<td>• What changes in population health outcomes are forecast to occur?</td>
</tr>
<tr>
<td>health outcome trends</td>
<td>• What health and non-health factors are expected to be responsible for these changes?</td>
</tr>
<tr>
<td></td>
<td>• What challenges will these changes create for the health system?</td>
</tr>
</tbody>
</table>

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

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

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**

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

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

<table>
<thead>
<tr>
<th>Area</th>
<th>Sample questions</th>
</tr>
</thead>
</table>
| 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       | • 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?  
                                     | distribution                                                                 |
|                                   | • 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       | • What are the challenges caused by the existing structural, funding, governance and  
                                     | organization                                                                |
| and organization                  |                                                                                   |
| Effectiveness and efficiency of    | • What are the challenges that affect the quality and safety of health services delivered to the population?  
                                     | health-care delivery                                                          |
|                                   | • What are the challenges affecting the effort, time and cost associated with delivering health services to the population? |
| Emergence of advanced medical      | • What are the opportunities and challenges associated with the emergence of advanced  
                                     | treatment regimes and the demand for these by the population and health-care providers? |
| regimes                           |                                                                                   |
| 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.

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.

<table>
<thead>
<tr>
<th>Manage the process</th>
<th>Engage with stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish the strategic context</td>
<td>Draft an initial vision</td>
</tr>
<tr>
<td>Learn from trends and experience</td>
<td>Identify required components</td>
</tr>
<tr>
<td>Gather information on the eHealth environment</td>
<td>Assess opportunities and gaps</td>
</tr>
<tr>
<td>Refine vision and develop strategic recommendations</td>
<td></td>
</tr>
</tbody>
</table>

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

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

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**

<table>
<thead>
<tr>
<th>Health system goal or challenge</th>
<th>eHealth outcome</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health workforce shortages primarily affect rural and remote communities, due to the concentration of professionals in urban areas.</td>
<td>Enable electronic access to appropriate health-care services for patients in rural and remote communities.</td>
<td>Enabling individuals to access services through electronic means will partly compensate for health workforce shortages.</td>
</tr>
<tr>
<td>To have halted by 2015 and begun to reverse the spread of HIV/AIDS in our country.</td>
<td>Provide individuals with electronic access to the information they need about preventing HIV/AIDS and other diseases.</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Facilitate improved monitoring and surveillance of population health through more effective data collection, reporting and exchange.</td>
<td>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.</td>
</tr>
</tbody>
</table>

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

```
<table>
<thead>
<tr>
<th>Health system priorities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits to health system</td>
</tr>
<tr>
<td>eHealth outcomes</td>
</tr>
</tbody>
</table>
```

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

<table>
<thead>
<tr>
<th>Example questions</th>
<th>Potential considerations</th>
</tr>
</thead>
</table>
| 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.

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

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

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
</table>
| 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

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
</table>
| 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

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
</table>
| **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

<table>
<thead>
<tr>
<th>Health system goal or challenge</th>
<th>eHealth outcome</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>Enable electronic access to appropriate health services for citizens in rural and remote communities.</td>
<td>Enabling individuals to access health services remotely through electronic means will partly address challenges of health workforce shortages.</td>
</tr>
</tbody>
</table>

Service and application components

<table>
<thead>
<tr>
<th>Service and application components</th>
<th>Service delivery channels (Telehealth)</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rationale</td>
<td>Telehealth services for electronic consultations support delivery of quality care to individuals living in areas affected by workforce shortages.</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
</table>
| **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).
Chapter 9. Identify the required eHealth components

Box 8. Linking an infrastructure component to an eHealth outcome

<table>
<thead>
<tr>
<th>Health system goal or challenge</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health workforce shortages affect rural and remote communities due to the concentration of professionals in urban areas.</td>
<td>Enabling individuals to access health-care services remotely through electronic means will partly address challenges of health workforce shortages.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>eHealth outcome</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable electronic access to appropriate health services for citizens in rural and remote communities.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Infrastructure component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-speed data connectivity</td>
<td>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.</td>
</tr>
<tr>
<td>Computing infrastructure</td>
<td>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).</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data structure standards</td>
<td>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.</td>
<td>• Referrals and specialist letters  • Health event summaries  • Prescriptions, test orders and results  • Care plans  • Real-time clinical data  • Appointments  • Electronic health records</td>
</tr>
<tr>
<td>Common terminologies</td>
<td>These enable information communicated electronically to make use of a common language for describing symptoms, diagnoses and treatments.</td>
<td>• Clinical coding standards  • Medical terminology standards  • Medicines terminology standards</td>
</tr>
<tr>
<td>Component</td>
<td>Description</td>
<td>Examples</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Messaging standards</td>
<td>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.</td>
<td>• Message structures&lt;br&gt;• Message transmission protocols&lt;br&gt;• Message acknowledgement protocols</td>
</tr>
<tr>
<td>Secure messaging standards</td>
<td>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.</td>
<td>• Privacy and confidentiality&lt;br&gt;• Authentication&lt;br&gt;• Non-repudiation</td>
</tr>
<tr>
<td>Software accreditation standards</td>
<td>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.</td>
<td>• Quality&lt;br&gt;• Security&lt;br&gt;• Interoperability</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Health system goal or challenge</th>
<th>eHealth outcome</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>To have halted by 2015 and begun to reverse the spread of HIV/AIDS in our country.</td>
<td>Facilitate improved monitoring and surveillance of population health through more effective data collection, reporting and exchange</td>
<td>Improved monitoring and surveillance of health outcomes related to HIV/AIDS is essential to the planning, management and implementation of health programmes.</td>
</tr>
<tr>
<td>Service and application components</td>
<td>Health care management and administration (Surveillance and At Risk Identification)</td>
<td>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.</td>
</tr>
<tr>
<td>Service and application components</td>
<td>Individual Electronic Health Information (EHR)</td>
<td>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.</td>
</tr>
</tbody>
</table>
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.

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>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
</table>
| **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

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
</table>
| 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

Figure 10. Stakeholder perspective model for a consumer stakeholder group

- **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

- **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

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

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

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

The diagram illustrates the consumer's perspective on health management, emphasizing access to health information, participation in care delivery, and pharmacy/diagnostic service needs. It highlights the proactive management trend towards consumer and family well-being.

### 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.
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, 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?

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.

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 pragmatic, 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\(^\text{11}\) 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.

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
</table>
| 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).
Table 25. Steps for refining the eHealth vision

<table>
<thead>
<tr>
<th>Step</th>
<th>Inputs</th>
<th>Sample questions</th>
<th>Possible outcomes</th>
</tr>
</thead>
</table>
| 1    | Analysis of eHealth environment:                                        | • 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.                                             |
|      | • re-use and sharing opportunities                                     |                                                                                                 |                                                                                                                                                                         |
|      | • gaps                                                                  |                                                                                                 |                                                                                                                                                                         |
|      | • risks and barriers                                                   |                                                                                                 |                                                                                                                                                                         |
|      | • vision timeframe                                                     |                                                                                                 |                                                                                                                                                                         |
| 2    | Outputs of step (1)                                                     | • 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.                                                              |
|      | • Understanding of health system outcomes                              |                                                                                                 |                                                                                                                                                                         |
|      | • Understanding of population health outcomes                          |                                                                                                 |                                                                                                                                                                         |
|      | • Understanding of non-health sectoral outcomes                        |                                                                                                 |                                                                                                                                                                         |
| 3    | Outputs of step (2)                                                     | • 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. |
|      | • Political commitment for national eHealth vision                     |                                                                                                 |                                                                                                                                                                         |
|      | • Stakeholder commitment to national vision                            |                                                                                                 |                                                                                                                                                                         |
|      | • Likely funding that will be available to deliver the 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**

<table>
<thead>
<tr>
<th>Ref</th>
<th>Recommendation</th>
<th>Rationale and specific actions</th>
<th>Dependencies</th>
</tr>
</thead>
</table>
| 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, R.34

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.
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.
ANNEX A
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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## Table 26. Examples of eHealth benefits 13,14,15

<table>
<thead>
<tr>
<th>Benefit area</th>
<th>Examples</th>
</tr>
</thead>
</table>
| 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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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

<table>
<thead>
<tr>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword</td>
</tr>
<tr>
<td>Purpose</td>
</tr>
<tr>
<td>Audience</td>
</tr>
<tr>
<td>How to read this document</td>
</tr>
<tr>
<td>Executive summary</td>
</tr>
</tbody>
</table>

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

**Table 27. Method summary**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Activities</th>
<th>Outputs</th>
</tr>
</thead>
</table>
| 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.                                                                                                                                                                                                 |

*Note: Table 27. Method summary is a summary of the method described in the Toolkit (Table 27).*
<table>
<thead>
<tr>
<th>Stage</th>
<th>Activities</th>
<th>Outputs</th>
</tr>
</thead>
</table>
| 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.                                                                 |
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

<table>
<thead>
<tr>
<th>Leadership and governance</th>
<th>Services and applications</th>
<th>Infrastructure</th>
<th>Standards and interoperability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leadership and governance mechanisms</strong></td>
<td><strong>Program execution</strong></td>
<td><strong>Individual electronic health information</strong></td>
<td><strong>Referrals</strong></td>
</tr>
<tr>
<td>Program execution</td>
<td>Stakeholder engagement</td>
<td>Electronic health record (EHR)</td>
<td>Health event summaries</td>
</tr>
<tr>
<td></td>
<td>Architecture</td>
<td>Electronic referrals</td>
<td>Health event summaries</td>
</tr>
<tr>
<td></td>
<td>Clinical safety</td>
<td>Electronic test ordering</td>
<td>Prescriptions</td>
</tr>
<tr>
<td></td>
<td>Management and operation</td>
<td>Care plan management</td>
<td>Test orders &amp; results</td>
</tr>
<tr>
<td></td>
<td>Outcomes management</td>
<td>Appointment booking and management</td>
<td>Care plans</td>
</tr>
</tbody>
</table>

#### Leadership and governance
- Leadership and governance mechanisms
- Strategy and investment
- Funding
- Investment management
- Evaluation and prioritization
- Investment allocation
- Budgeting and tracking

#### Services and applications
- Services and applications
- Services and applications
- Services and applications
- Services and applications

#### Infrastructure
- Infrastructure
- Infrastructure
- Infrastructure
- Infrastructure

#### Standards and interoperability
- Standards and interoperability
- Standards and interoperability
- Standards and interoperability
- Standards and interoperability

---

**Annex E. National eHealth component map » page 85**
Figure 13. National eHealth component map: example
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**

<table>
<thead>
<tr>
<th>Fully regulated</th>
<th>Guided market</th>
<th>Free market</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of governance</td>
<td>Bureaucratic governance</td>
<td>Market governance</td>
</tr>
<tr>
<td>Structure</td>
<td>Centralised</td>
<td>Combines centralised and decentralised</td>
</tr>
<tr>
<td>Controls</td>
<td>Legislation and sanctions</td>
<td>Performance based on outcomes</td>
</tr>
</tbody>
</table>

**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.

---

## Definitions of terms used in the Toolkit

<table>
<thead>
<tr>
<th>Part</th>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part I: Establishing a national eHealth vision</td>
<td>Strategic goals and challenges</td>
<td>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.</td>
</tr>
</tbody>
</table>
| | 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. |
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.