

Health Information Strategy Action Committee

Action Zone 1 – Health Network Strategy

Preliminary Scope and Approach

This document has been developed in consultation with the sector and portrays the scope, principles, key enablers and implementation approach for this Action Zone at a point in time. It should be used as a reference to inform and guide business and technical decision making for initiatives related to this Action Zone.

If you have any questions or require assistance please communicate with HISAC through enquiries@HISAC.govt.nz or write to:

The Action Zone Development Leader
HISAC Office
P O Box 5013
Wellington

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Vision

Participants in the New Zealand health and disability Sector can easily, effectively and reliably communicate over a secure network in a secure environment.

Strategy

Implement a national approach to improving the quality, speed and cost effectiveness of Sector communications for voice, data, imaging and video, using secure networks.

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About this document

Action Zone document structure	<p>The 2005 Health Information Strategy for New Zealand (HIS-NZ) identified 12 Action Zones as areas where effort in the health and disability Sector (the Sector), should be focused over the next three to five years.</p> <p>A 'Preliminary Scope and Approach' (PS&A) document has been prepared for each Action Zone. The PS&A documents build the case for change, including benefits the Sector can expect to achieve and suggest an approach to implement the change.</p> <p>Each individual PS&A document should be read in conjunction with the "HIS-NZ Implementation Approach" (a PowerPoint presentation). It describes common themes that have emerged from the PS&A work, the key enablers that are necessary to support a common approach to information management, and the priority areas where HISAC and the Sector can assist with implementing the Action Zones.</p>
Action Zone 1: Description of a National Network	<p>HISAC anticipates that a National Network for the Sector will be a "national health network community":</p> <ul style="list-style-type: none">• That provides real-time and messaging connectivity between all health practitioners, organisations, funding agencies and policy makers to facilitate improvement in health outcomes for New Zealanders by ensuring "the right health information is in the right place at the right time" for clinical, administration and planning decisions;• Whose Sector governance is committed to continual development and upgrading of the electronic network in light of expectations and technology developments;• To which all health practitioners and organisations, whether they are large hospitals, independent practitioners, or NGO organisations, can join and easily use as necessary to maximise opportunities to improve health outcomes through e-Health;• A "national electronic health network" that meets the performance and security requirements of the "national electronic health network community", is cost effective and provides an infrastructure that encourages the development and use of applications by users that will achieve the Network's objectives;• This Preliminary Scope & Approach (PS&A) document builds the case for change in the Health Network Strategy Action Zone – including benefits that the Sector can expect to achieve. It also recommends an approach for the Sector to implement change.
Acknowledgements	<p>The basis for building this PS&A document has been:</p> <ul style="list-style-type: none">• Engagement with the Sector – the range of people interviewed is shown in Appendix A of this document;• Analysis of themes occurring during the engagement; <p>During this process, a number of other documents have been reviewed:</p> <ul style="list-style-type: none">• Building a Next Generation Health Network (NGHN); Current State Diagnosis;• High Level Architectural Blueprints; NGHN Stage 1 Project;• Health Network Code of Practice; SNZ HB 8169:2002;• Sector Requirements Definition; NGHN Stage 1 Project. <p>A number of workshops and meetings were attended, associated with the NGHN project. Consistent with other PS&As, this document reflects the view expressed by the Sector stakeholders. In general, this appears to be consistent with the views being developed as part of the NGHN project.</p>

Context for this PS&A document

Why do it?	What is it?	Outputs
Network 'as is' description.		
To obtain agreement on the current state of the Health Network. An agreed platform from which forward progress can begin.	<ul style="list-style-type: none"> • Current network capability; • Bottlenecks and barriers; • Network management. 	<ul style="list-style-type: none"> • Cisco current state diagnostic; • PS&A current state description.
Network Required Outcomes		
To get an understanding of what the Sector expects from the future Health Network? An agreed target state for the Health Network.	<p>What functions should the network have?</p> <p>How should it fulfil those functions?</p>	<ul style="list-style-type: none"> • Cisco Requirements document; • PS&A Future State description.
Health Network Code of Practice		
To get agreement on the implications of privacy legislation on any future Health Network.	Sets out the way that networks must be implemented and managed in order to meet the requirements of the health Sector.	<ul style="list-style-type: none"> • Updated Health Network Code of Practice.
Best Practice Network Architecture		
To understand what a best practice Health Network might be in the New Zealand context.	<p>An architectural model for the Health Network in New Zealand, including</p> <ul style="list-style-type: none"> • Network architecture • Service attributes • Components; and • Specifications/Blueprints 	<ul style="list-style-type: none"> • High Level Architectural Blueprint; • Architectural design and specification.
Network – The Way Forward		
To understand the best way to move forward with any changes to the New Zealand Health Network.	<p>A set of strategic principles around which any changes to the Health Network can be based. Covering such areas as:</p> <ul style="list-style-type: none"> • Ownership model; • Cost modelling; • Management and support structures; • Availability requirements. 	A network policy document setting out the principles on which the Network design and implementation can be based.
Network Design		
To establish the design principles that will ensure that the New Zealand Health Network provides a pragmatic solution to the communication and connectivity needs of the Sector.	<p>A set of design principles for the New Zealand Health Network that blend together the:</p> <ul style="list-style-type: none"> • Best practice as set out in the Architectural Blueprints • The Updated Health Network Code of Practice; and • The Strategic Principles. 	A network design document that can be used to inform procurement and implementation decisions by organisations connecting to the Health Network.
Implementation planning		

Why do it?	What is it?	Outputs
To paint a picture of the way that the Health Network will evolve over the short to medium term.	Development of a plan which sets out the Key Actions, along with the associated milestones and deliverables that are necessary to move the Health Network from its current state to the desired future state.	Narrative, timelines and agreements that set out Sector commitments to develop their Network connectivity/connections.

This document is	This document is not
Overview of the current state of the Sector with respect to the Health Network	Detailed 'as is' network review
High-level user definition of the future state for the Health Network	Detailed network design or architecture
Identification of high-level requirements for the Health Network	Detailed definition of user requirements
A recommended approach for making progress with the Health Network	Detailed implementation planning or cost benefit analysis
Qualitative definition of benefits available from improving	Quantitative definition of benefits

Executive Summary

Vision and Strategy

The Vision for a National Network is: “Participants in the New Zealand health and disability Sector can easily, effectively and reliably communicate over a secure network in a secure environment”.

The Strategy for a National Network is the “Implementation of a national approach to improving the quality, speed and cost effectiveness of Sector communications for voice, data, imaging and video, using secure networks.”

Action Zone 1: Description of a National Network

- HISAC anticipates that a National Network for the Sector will be a “national health network community”:
- That provides real-time and messaging connectivity between all health practitioners, organisations, funding agencies and policy makers to facilitate improvement in health outcomes for New Zealanders by ensuring “the right health information is in the right place at the right time” for clinical, administration and planning decisions;
- Whose Sector governance is committed to continual development and upgrading of the electronic network in light of expectations and technology developments;
- To which all health practitioners and organisations, whether they are large hospitals, independent practitioners, or NGO organisations, can join and easily use as necessary to maximise opportunities to improve health outcomes through e-Health;
- A “national electronic health network” that meets the performance and security requirements of the “national electronic health network community”, is cost effective and provides an infrastructure that encourages the development and use of applications by users that will achieve the Network’s objectives;
- This Preliminary Scope & Approach (PS&A) document builds the case for change in the Health Network Strategy Action Zone – including benefits that the Sector can expect to achieve. It also recommends an approach for the Sector to implement change.

Key Features

It is envisaged that a National Network for the whole health and disability Sector may include the following key features:

- A common underlying infrastructure for secure, reliable, cost effective, easy-to-use connectivity between all Sector participants; including the use of a simple, transparent charging model;
- An environment that fosters collaboration and information sharing between all Sector participants;
- Effective governance and management processes that ensure implementation of appropriate standards, policies and audit processes;
- Appropriate privacy, authentication and security processes; including taking reasonable efforts to keep identifiable data private;
- Commitment to the review and implementation of future technologies and services;
- Inclusion of alternative services and devices;
- Provision of the underlying connectivity layer to facilitate sharing health information;
- Network investment remains ‘just ahead’ of application investment.

Network Design Planning

The future Health Network should be based on Internet Technologies. The power of these technologies is that they are inherently flexible and will allow network designs to be abstracted from the business processes that are being implemented and the computer systems that are supporting those processes.

Health networking is likely to include:

- A National Network;
- A number of interconnected sub-networks;
- Private networks – generally within one organisation; and
- Governance, management and administration processes.

Networks can be implemented and managed according to the dynamics of the Sector at any point in time, but they will provide connectivity between any two Sector organisations that wish to exchange data, regardless of the network or sub-network to which they subscribe.

Bring together the strategic network decisions, the revised network code of practice, the architectural documents from the NGHN project - the architectural blueprints, and the architectural design and specification documents - to create:

- Detailed technical specifications for the future Health Network;
- Detailed specifications of the governance, management and administration processes;
- A plan for implementing the future Health Network across the Sector.

What Happens Today

Definition

The Health Network forms part of the national framework for the secure and private collection and sharing of electronic health information within the Sector. It provides an important component of integrated health care.

The Health Network is a 'trusted community', comprising:

- Connection providers – the providers of the physical electronic network and related services that support the linking of organisations in the Sector. HealthLink and Telecom are the two currently accredited connection providers;
- Security solution providers – those who provide security solutions which are added to the connection, HealthLink and Telecom are the two currently accredited security solution providers;
- Information service providers – those who provide the services used to collect and share electronic health information;
- Users – the approved organisations and individuals who use the Health Network services;
- Administration and support – the people, systems, processes and documentation required to register and support users, and to provide monitoring and reporting services; and
- Governance – oversight to ensure that standards, policies and practices are developed, adopted, implemented and maintained, that security risks are identified and addressed, and that service quality expectations are set and met.

Networking today

As well as the accredited networks that make up the New Zealand Health Network, the New Zealand health and disability Sector is using a number of other electronic health networks, in particular there are:

- **HealthLink** – an extensive New Zealand-wide EDI network;
- **NZ Telepaediatric Services Network** – a dedicated video conferencing

Projects in progress

system;

- **Mobile Surgery Services** – a fixed radio-based network;
 - **Plus various ISDN networks** for video conferencing, provider-based networks, and inter-regional DHB networks typically based on fixed high-speed connections; and
 - **Multiple intra-DHB networks** utilising various mediums.
-

The need for improved connectivity is widely recognised across the Sector. A number of projects have been completed and a number of projects are under way:

- **DHB 'One Office' networks:** DHBs have recognised the need for improved networking to enable their business. DHBs are working together by region, to procure and implement networks to enable better business processes.
 - **Broadband installations:** There is already recognition that improved connectivity will help improve primary care. A number of Managed Service Organisations (MSOs) and DHBs have, on the back of specific projects, funded broadband connectivity into their associated GP practices.
 - **Next Generation Health Network (NGHN):** The Ministry of Health, as a part of its National Systems Development Programme, has started a project to consider the Next Generation Health Network.
 - **Privacy, Authentication and Security (PAS):** A significant piece of work was undertaken in 2003-2004 to develop a Health Information Management Code of Practice. Chapters in the document cover areas such as Privacy, Authentication and Security (colloquially known as PAS) and Governance.
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Challenges relating to the existing Health Network

The engagement process that was undertaken focused on communication and connectivity between practitioners, services and systems that make up the New Zealand health Sector. This allowed us to identify a number of specific network related problems:

- The current network is both inflexible and expensive;
 - The strict encryption and security requirements set out in the Health Network Code of Practice are perceived as a driver for the inflexibility and expense;
 - There is a 'Catch 22' between investment in the Health Network and investment in applications that use the network;
 - Payment mechanisms - pay per transaction - discourage network use;
 - The effort required to administer digital certificates is poorly perceived by the Sector;
 - There is limited support for practitioners who are using the network;
 - A lack of physical infrastructure constrains network implementations in some areas.
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Challenges for communication and connectivity

The engagement process also identified a number of challenges related to constraints on communication and connectivity within the Health Network:

- There is limited drive to change the way that the Sector works to a more networked model;
 - There is no commonly accepted definition of what/who makes up the Sector;
 - There is significant inefficiency and risk associated with current paper based information exchange;
 - An excessive amount of time is taken to complete administrative tasks;
 - The lack of standardisation of systems imposes an overhead on the cost
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of implementing/supporting new systems/services;

- There is a lack of agreed data standards, which makes it difficult for organisations to exchange meaningful data.
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Key Action Areas to achieve the National Network Strategy

Overview

The Sector should be looking to increase connectivity to the existing Health Network to support immediate progress in other Action Zones, e.g. start getting pharmacists on-line.

The Sector has identified some 'current' actions that will provide added value to network users in both the short and the long term, e.g. a Sector directory and secure e-mail.

Other, medium to long term actions include:

- Review the Health Network Code of Practice;
 - Review the initial NGHN deliverables and the place of the existing Health Network in light of the strategic policy decisions;
 - Create a technical design and an implementation plan that meets the requirements of the network strategy, the updated code of practice, and the NGHN work to date.
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Increased connectivity

To provide a base for progress in the other Actions Zones it is necessary to increase the number of Sector participants who are connected to the Health Network.

HISAC, in its Network Management role, should start working with other Sector organisations to get them connected to the Health Network.

Organisations should be chosen according to:

- The strength of their involvement in the priority Action Zones;
 - The ease of their connection to the existing network; and
 - The ease of their migration to any changed Health Network.
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Current Actions

During our engagement, practitioners have signalled that both secure e-mail and a robust Sector directory would be valuable services that could be developed and delivered across the Health Network.

Review Network code of practice

HISO have already planned a review of the Health Network Code of Practice. The updated Code of Practice must:

- Reflect the requirements of the updated Privacy, Authentication and Security framework;
 - Focus particularly on the aspects related to Digital Certificates and Encryption, which have come in for comment and criticism during discussions with the Sector; and
 - Consider also some of the recommendations that have been made by the Cisco team in developing the NGHN architectural documents.
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Stakeholder Benefits

Summary

- Patients will experience benefits as the Sector changes the way that it works and uses information;
 - Care practitioners will be able to use the upgraded Network to improve the care that they provide for their patients;
 - The Network will provide opportunities for health care organisations to change the way their business operates, through better communication with both care practitioners and funding agencies;
 - The Health Network is an enabler of change that will allow information to
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flow at a greater speed and in a more managed fashion around the Sector;

- Funding agencies, policy advisors, and researchers will experience benefits as the Sector changes the way that it works and uses information.

Indicators of Success

Progress in Action Zone 1 can be measured by the perceived value that the Health Network brings to the Sector. At its simplest this could be measured by a survey of Network users.

A more scientific indicator could be calculated based on a formula that includes:

- The number of connections to the Health Network;
- The perceived value that the Network brings to health businesses; and
- The ease of use of the Health Network and applications.

Next Steps

Further engagement with the Sector

HISAC is leading the Sector through the implementation of the HIS-NZ Action Zones. It must also represent the voice of the Sector. Consequently, significant engagement has taken place during the development of this Preliminary Scope and Approach document.

It is important that engagement continues, and that input from the wider Sector is obtained and incorporated into the approach. The more closely that the approach represents the needs of the Sector, the more it will be supported, the easier it will be to implement and better results will be obtained.

Building on work completed to date

In the recent past considerable work has been done relating to the Health Network. This work is described in more detail in the body of this document. The diagram below shows how those pieces of work have helped to build the overall picture presented in this PS&A and how they have contributed to the plan for moving forward in this Action Zone.

The red circles show the next pieces of work that need to be completed.

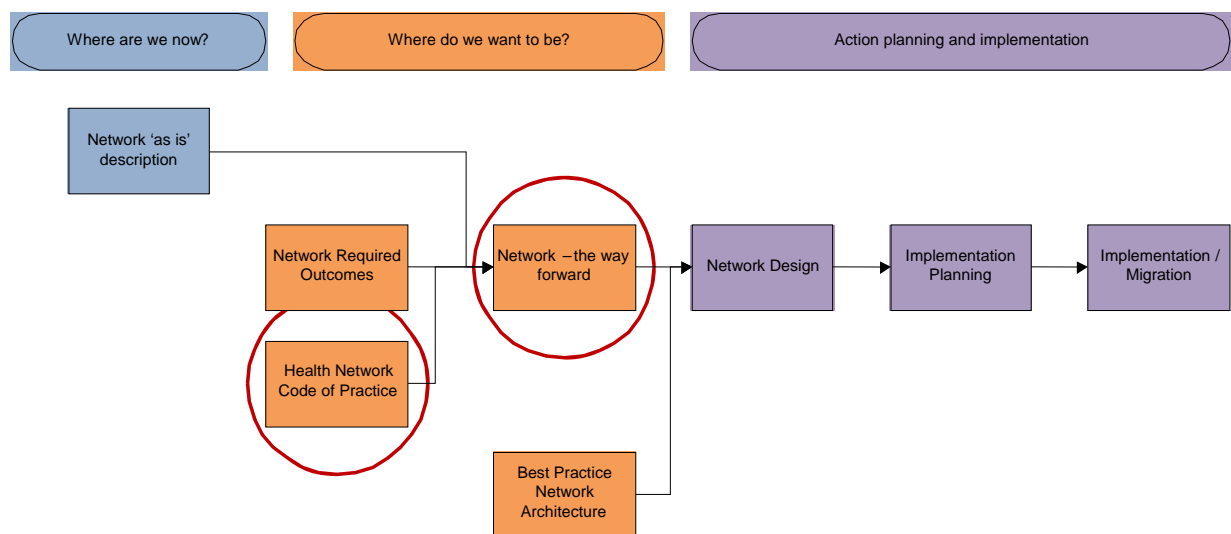


Figure 1 Context for this PS&A

1 What Happens Today

1.1 Introduction

Summary

The Health Network is an electronic network linking together the computers and communications networks of Sector stakeholders, with appropriate governance, management, administration and support structures¹.

There is a high level of connectivity in the Sector, but it is disparate, not well orchestrated and limited to discrete uses.

Purpose of the Health Network

Health information is increasingly captured and exchanged electronically. HIS-NZ seeks a considerable increase in the amount of data that is captured and exchanged in this way.

The purpose of the Health Network is to provide the Health Sector with a platform for the secure capture, access and exchange of information.

Health Network Code of Practice

A number of pieces of legislation tell us how the word 'secure' should be interpreted in the context of health information. These are the:

- Health Information Privacy Code 1994;
- Privacy Act 1993;
- Official Information Act 1982;
- Health & Disability Commissioner Act 1994;
- Health & Disability Services (Safety) Act 2001;
- Treaty of Waitangi Act 1975.

These documents have been interpreted to produce the Health Network Code of Practice (2002), which describes how health care organisations can safely exchange electronic health information in compliance with these pieces of legislation.

1.2 What is the Health Network?

Summary

The Health Network forms part of the national framework for the secure and private collection and sharing of electronic health information within the Sector. It provides an important component of integrated health care.

The Health Network is a 'trusted community' comprising:

- Connection providers – the providers of the physical electronic network and related services that support the linking of organisations in the Sector. HealthLink and Telecom are the two currently approved connection providers;
- Security solution providers – those who provide security solutions, added to the connection. HealthLink and Telecom are the two currently approved security solution providers;
- Information service providers – those who provide the services used to collect and share electronic health information. There are many of these, e.g. Pharmac, who provide a special authorities approval service;
- Users – the approved organisations and individuals who use the Health Network services. The Ministry of Health, ACC, DHBs, hospitals, PHOs, 30 percent of general practice and other primary care organisations, over 600 organisations in total, are subscribing to and using the New Zealand Health Network;

¹ Services used by practitioners connected to the Health Network are not considered to be a part of the network itself.

- Administration and support – the people, systems, processes and documentation required to register and support users, and to provided monitoring and reporting services. This work is overseen by a small team working in the HISAC office;
 - Governance – to ensure that standards, policies and practices are developed, adopted, implemented and maintained, that security risks are identified and addressed and that service quality expectations are set and met. This role is carried out by the Infrastructure Sub-Committee (ISC) of HISAC.
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Other Network connectivity

As well as the New Zealand Health Network, the Sector is using a number of other electronic health networks, in particular:

- **HealthLink** – this extensive New Zealand-wide EDI network connects the majority of primary and secondary organisations and funding agencies and is used for claims, exchanging laboratory and x-ray results (excluding images) and discharge summaries;
 - **NZ Telepaediatric Services Network** – a dedicated video conferencing system connecting some 50+ end points;
 - **Mobile Surgery Services** – a fixed radio-based network connecting various health organisations for telepresence video conferencing;
 - **Various ISDN networks** for video conferencing are in place;
 - **Various provider-based networks** (Hawke’s Bay, Mid-central, Lakes District Wireless Primary Care Network, Pegasus primary health care networks);
 - **Various inter-regional DHB networks** typically based on fixed high-speed connections;
 - **Multiple intra-DHB networks** utilising various mediums. Fixed (layer 2/3 carrier services, dark or grey fibre), mobile (cellular), wireless (paging, Wifi, limited WiMax) and a variety of radio and microwave technologies.
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Cisco Current State Audit

A recent current state diagnosis, carried out by Cisco Systems on behalf of the Ministry of Health concluded the following:

- The Sector is cooperative in orientation and has significant connectivity assets and innovative practices that will be enhanced by better connectivity;
 - There are significant political, financial, organisation and technical challenges to be addressed if the full value of work in Action Zone 1 is to be realised;
 - Some of the funding and expertise necessary to implement and maintain a National Health Network should be centralised;
 - Current health networks are fragmented and underpowered and meet only the basic requirements;
 - Some significant changes are required to Health Network structure, governance and funding. HISAC should become the governing body for the Ministry’s Next Generation Health Network initiative;
 - HISAC’s role should be formally accepted by stakeholders across the Sector and HISAC should be given the resources to carry out this governance role effectively;
 - Governance processes, including funding and procurement, should be improved to ensure greater consistency across New Zealand of basic standards of design and implementation.
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1.3 Projects in Progress

Introduction

The need for improved connectivity is widely recognised across the Sector. A number of projects to enhance connectivity have either been completed, or are in progress.

DHB 'One Office' networks

DHBs have recognised the need for improved networking to support their business. DHBs are working together by region to procure and implement networks that enable better business processes.

The inflexible and expensive nature of the current Health Network, allied with the limited number and value of services delivered across the Network, means that in most cases DHBs have turned to commercially available products – such as Telecom's 'One Office' – to provide that connectivity.

Broadband installations

There is already recognition that improved connectivity will help improve primary care. A number of Managed Service Organisations (MSOs) and DHBs have, on the back of specific projects, funded broadband connectivity into their associated GP practices.

An increasing number of primary caregivers have broadband connectivity to both the Health Network and the general Internet.

Next Generation Health Network (NGHN)

The Ministry of Health, as a part of its National Systems Development Programme, has commenced a project to decide on the next generation Health Network (NGHN).

NGHN phase 1 has four workstreams:

- An Architecture/Design workstream. The key output will be an Architectural Blueprint;
- A Service Specification workstream. The key output will be a set of specifications for the core NGHN service components;
- A Policy Framework workstream. The key output will be a set of frameworks, standards and/or policies to guide the Health Network moving forward; and
- An Implementation Planning workstream to develop a high-level implementation plan for NGHN.

Early in 2007, the NGHN programme will deliver its planning outputs to HISAC for final review and approval.

Privacy, Authentication and Security (PAS)

A significant piece of work was undertaken in 2003-2004 to develop a Health Information Management Code of Practice. It reflected the Sector's thinking – at the time – on a number of key issues related to information management.

The Code of Practice work has been reviewed and incorporated by a number of Sector participants. Chapters in the Code of Practice document cover areas such as Privacy, Authentication and Security (PAS) and Governance.

This work will be incorporated into a review, planned by HISO, of the Health Network Code of Practice.

2 Areas for Improvement

2.1 Introduction

Summary

The engagement process undertaken in developing this PS&A document, focused on communication and connectivity between practitioners, services and systems that make up the New Zealand health Sector. This identified three main categories of challenges, described in this section. These challenges are:

- Specific challenges relating to the existing Health Network. These can be summarised as follows:
 - Current electronic Health Network options available are varied in almost every respect;
 - There is fragmented and disparate uptake of connectivity and broadband and as a result, the latest technologies are not maximised by the Sector;
 - Many aspects of the current New Zealand Health Network will not support a next generation whole-of-health Network;
 - Appropriate levels of security are not implemented universally across the Sector.
- Constraints placed on communication and connectivity and consequently use of the Health Network, due to the way in which the Sector is structured and/or operates. These emphasise the need for a focus on changing the way the Sector operates in order to obtain the best value from any network-focused change programme, including:
 - Many aspects of the current New Zealand Health Network will not support a next generation whole-of-health Network;
 - Many current networks are incompatible with each other, hindering the interoperability necessary to support the delivery of a wider range of services and information exchanges;
 - The next generation Health Network will require an interoperability framework, a review of the Health Network Code of Practice and implementation of the PAS;
 - Targeted investments to maximise returns are crucial, particularly in the area of investing in extending the Network.
- A number of questions were raised during the development of this document. These questions relate to the infrastructure and environment of the Health Network.

More detail around these three categories of challenges for the Health Network is presented below.

2.2 Network-specific challenges

Inflexible and Expensive

The **challenge** is that the current Health Network is inflexible and expensive.

This **affects** all organisations that want to communicate electronically.

The **impacts** are:

- In general it is difficult, impossible and/or expensive to use the Health Network to introduce innovations;
 - Organisations (e.g. DHBs, Surgical Bus, MSOs) have/are setting up parallel networks to the Health Network to achieve their objectives;
 - There tends to be a new, often point-to-point network implemented for significant new projects. It is generally easier to procure an additional service from Telecom than it is to work within the current Network.
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Strict encryption and security requirements

The **challenge** is that the encryption and security requirements set out in the Health Network Code of Practice are stricter than those which people working in the Sector believe is necessary.

This **affects** those investing in network/IT solutions for the Sector

The **impacts** are:

- Parallel investments are taking a more pragmatic view of security requirements than the existing Health Network;
- This view enables purchasing organisations to “get more network for their money”.

Lack of active audit process

The **challenge** is that there is no active audit process checking that network implementations meet the requirements set out in the Health Network Code of Practice.

This **affects** patients and care practitioners.

The **impacts** are:

- Patients cannot be sure that their data is being stored and transmitted securely;
- Care practitioners may unwittingly find themselves exposing patient information to unauthorised parties.

‘Catch 22’ of investment in the Health Network

The **challenge** is that there is a ‘Catch 22’ around investment in the Health Network.

This **affects** those keen to invest and enable change in the Sector and those who would benefit from change.

The **impacts** are:

- There are a limited number of services available to justify a significant investment in networking;
- Investment in the development and provision of services is being limited by the lack of a comprehensive network;
- Change agents in the Sector are having to take a ‘build it and they will come’ approach to improved networking. As a consequence, the organisations and practitioners making the investments are not reaping the maximum benefit.

Payment mechanisms discourage Network use

The **challenge** is that the “clip the ticket/pay per transaction” mechanism by which most elements of the network are funded discourages use of the Network.

This **affects** all Sector participants who want to do more online.

The **impacts** are:

- Practitioners are penalised financially for doing more business online;
- And for that reason they limit their use of the Network.

Administering the current Digital Certificates regime

The **challenge** is that the current Digital Certificates regime creates too much administration work across the Sector and is of limited value.

This **affects** all users and potential users of the Health Network.

The **impact** is that this is seen as a barrier to joining the current Health Network and extending the use of the Network.

Lack of support for practitioners

The **challenge** is that the current Network is poorly managed. There is very limited, or no support available for practitioners.

This **affects** all users and potential users of the Health Network.

The **impact** is that practitioners feel they need expertise in networking, which is a barrier to them joining the current Health Network.

Lack of physical infrastructure

The **challenge** is that a lack of physical infrastructure hampers connectivity in a number of areas of New Zealand.

This **affects** a large number of health practitioners, particularly those in rural New Zealand.

The **impacts** are:

- Some health practitioners are unable to connect to the Health Network;
 - Some health practitioners can connect to the network but are not able to use it to do what they want to do;
 - While a number of DHBs are working around connectivity/bandwidth issues through the use of Citrix as an application delivery mechanism, substantial effort is put into managing bandwidth that would be better focused on new ideas/applications.
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2.3 Constraints on communication/connectivity

Limited drive to change the way the Sector works

The **challenge** is that practitioners working in the Sector have become accustomed to working in a particular way.

This **affects** those willing and able to change the way the Sector works.

The **impacts** are:

- There is limited drive from practitioners to make any changes to work practices in the Sector;
 - Improving information flows between practitioners is hampered by the difficulty of making change;
 - Those who can see the opportunities are having to work harder to create momentum toward change.
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No commonly accepted definitions

The **challenge** is that there is no commonly accepted definition of what/who makes up the 'Health and Disability Sector'.

This **affects** the flow of information between care practitioners.

The **impacts** are:

- Information is generally only shared between the traditional primary and secondary care organisations (e.g. hospitals and GPs);
 - Organisations providing care to patients and families, e.g. midwives, Plunket, paramedics and residential care services, make decisions with less information than is optimal.
-

Inefficiency and risk associated with paper based information

The **challenge** is that inefficiency and risk is created by the current default of paper-based information exchange between practitioners.

This **affects** practitioners, care organisations and the Sector as a whole.

The **impacts** are:

- When data is re-entered into the receiver's system, this takes significant effort and creates the potential for errors;
 - A number of tests are repeated because the practitioner does not have access to the results of the original test, e.g. GP to DHB;
 - Prescriptions are often faxed to pharmacists, i.e. for people on holiday, unable to pick up a prescription;
 - Much paper communication coming from patients is scanned and stored electronically.
-

Excessive time taken to do administrative tasks

The **challenge** is that clinical staff spend more time than is necessary time doing administrative tasks.

This **affects** both practitioners and patients.

The **impacts** are:

- Practitioners are unable to see as many patients as they would if the
-

administrative burden was less;

- Practitioners spend less time with their patients than they would if the administrative burden was less.
-

Lack of standardised systems

The **challenge** is the lack of standardisation of systems used across the Sector.

This **affects** all practitioners who use or support IT solutions across the Sector.

The **impact** is that the variability of systems across the Sector increases the effort and cost of implementing/supporting any existing or new applications.

Lack of agreed data standards

The **challenge** is the lack of agreed data standards.

This **affects** practitioners across the Sector who want to transfer or share data.

The **impacts** are:

- Functions that work will, in general, require practitioners to use systems from the same manufacturer;
 - Data can be transmitted between practitioners, but not properly interpreted or used.
-

2.4 Questions Raised

Infrastructure and Environment Issues

In developing this PS&A document, a number of questions were raised. It is important that the Sector develops addresses these questions before any action work is carried out. These Questions are:

- How much if any of the Network is the Sector prepared to build/own; how much will be outsourced?
 - Is there a policy on a maximum or minimum number of vendors who should be able to provide Health Network connectivity?
 - Do we intend to upgrade existing networks to meet the new architectural criteria or will we implement a new network with gateways to the existing networks?
 - Which parts of the Sector do we expect to connect to the network? When and in what numbers?
 - How should the network support & management function be structured? Is there a standard framework on which we can base our support processes? What will be the roles of different Sector participants in this?
 - What are the availability requirements of Sector participants? Are there different availability requirements for different services?
 - How will the Sector work together to obtain maximum benefits in procurement from vendors whilst still enabling commercial decision making by individual organisations?
 - What is the charging model that will be used to determine the cost for a Sector participant to join the network? Should we just leave this for the market to decide/
 - How will the network development lead/support more general change across the Sector?
-

3 Achieving the National Network Strategy

3.1 Introduction

Action Zone 1 Strategy

Implement a national approach to improving the quality, speed and cost effectiveness of Sector communications for voice, data, imaging and video, using secure networks.

Description of the National Health Network

HISAC anticipates that a National Network for the Sector will be a “national health network community”:

- That provides real-time and messaging connectivity between all health practitioners, organisations, funding agencies and policy makers to facilitate improvement in health outcomes for New Zealanders by ensuring “the right health information is in the right place at the right time” for clinical, administration and planning decisions;
- Whose Sector governance is committed to continual development and upgrading of the electronic network in light of expectations and technology developments;
- To which all health practitioners and organisations, whether they are large hospitals, independent practitioners, or NGO organisations, can join and easily use as necessary to maximise opportunities to improve health outcomes through e-Health.

A “national electronic health network” that meets the performance and security requirements of the “national electronic health network community”, is cost effective and provides an infrastructure that encourages the development and use of applications by users that will achieve the Network’s objectives.

3.2 Key Features of a National Network

Summary

It is envisaged that a National Network for the whole health and disability Sector may include the following key features:

- A common underlying infrastructure for secure, reliable, cost effective, easy-to-use connectivity between all Sector participants; including the use of a simple, transparent charging model;
 - An environment that fosters collaboration and information sharing between all Sector participants;
 - Effective governance and management processes that ensure implementation of appropriate standards, policies and audit processes;
 - Appropriate privacy, authentication and security processes; including taking reasonable efforts to keep identifiable data private;
 - Commitment to the review and implementation of future technologies and services;
 - Inclusion of alternative services and devices;
 - Provision of the underlying connectivity layer to facilitate sharing health information;
 - Network investment remains ‘just ahead’ of application investment.
-

3.3 Planning to achieve the National Network Strategy

Introduction

Planning to achieve the National Network Strategy may be based around the revised Network Code of Practice, outputs from the NGHN project (architectural blueprints, and architectural design and specification documents) to create:

- Detailed technical specifications for the Health Network;
 - Detailed specifications of the necessary governance, management and administration processes;
 - A plan for implementing the Health Network across the Sector, which could include consideration of the following elements:
 - The procurement of any new Network elements that are required, including who is responsible for funding them;
 - Description of the roles of key players in the governance, management and administration processes;
 - An approach for the upgrade of existing accredited and non-accredited Health Networks, or the migration of users to accredited Networks;
 - An approach for connecting new users to the Network;
 - An approach for implementing the new governance, management and administration processes.
-

Designing the National Network Infrastructure

HISAC believes that the design of the Health Network should reflect the dynamics of the emerging health business.

This design should recognise that:

- All health care practitioners are part of the same health care system and will work together to provide care for patients;
 - Health care practitioners and organisations run their own businesses, making purchasing and procurement decisions that best reflect their individual needs;
 - Regional DHB clusters, PHOs and MSOs are providing a leadership role in driving change initiatives;
 - Commercially, the Sector has more buying power as a whole than as individual organisations.
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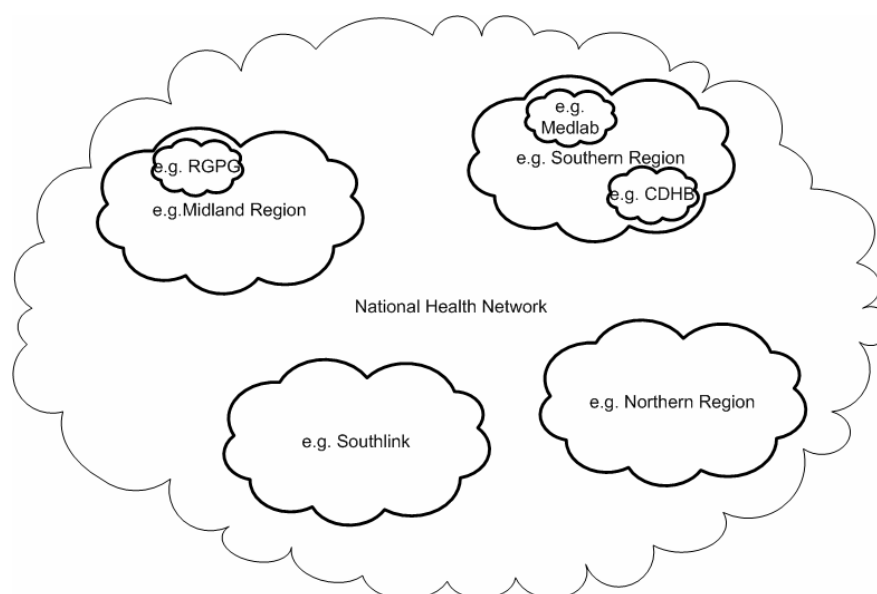


Figure 2: Schematic view of the Health Network

3.3.1 Design Components of the National Network

Internet technologies

The Health Network should be based on Internet Technologies.

The power of these technologies is that they are inherently flexible and will allow network designs to be abstracted from the business processes being implemented and the computer systems that are supporting those processes.

Networks can be implemented and managed according to the dynamics of the Sector at any point in time and they can also provide connectivity between any two Sector organisations wishing to exchange data, regardless of the network or sub-network to which they connect.

Connectivity importance

All health care practitioners and organisations in New Zealand are part of the same health care system. As well as providing care for patients, Sector organisations (Hospitals, PHOs, etc.) are required to provide data to national organisations such as the Ministry of Health and ACC.

The National Health Network must link all participants in the Sector and provide a path for data to be transferred between them, e.g.:

- It must support the care pathway of a sick child from Canterbury whose care might involve Plunket -> GP -> Canterbury DHB -> Starship Hospital in Auckland;
 - It must enable all practitioners and organisations from across the country to submit claims to Healthpac/ACC.
-

Sub-networks

The National Health Network will be made up of a number of sub-networks that are generally implemented (or procured) by management organisations around the Sector on behalf of the practitioners.

By submitting to an agreed set of design principles, these sub-networks can be assured of their ability to interconnect and exchange information with other sub-networks and/or the National Health Network.

Private networks

The largest volume of patient identifiable data flows around inside one organisation, e.g. between different facilities in a hospital. DHBs and health Sector organisations, in general, use private networks to connect their various facilities.

These networks remain outside of the Health Network and are managed by the individual organisations. However, **these networks must comply with the Health Network Code of Practice.**

Action Zone One – Lead Project

The HISAC philosophy is to identify projects in the Sector that can be lead implementers in each of the Action Zones.

The Ministry of Health is currently implementing Phase One of the 'Next Generation Health Network' (NGHN) project.

Although funding for the later phases of the project has not yet been confirmed, it seems appropriate for HISAC to make the NGHN project the lead implementer for the changes required in Action Zone One.

Governance and Management

The National Health Network will continue to be governed by a Sector representative body such as the HISAC Infrastructure Sub-Committee (ISC).

Management, administration and support processes will be robust and based on a recognised framework (such as ITIL).

These processes will integrate the efforts of those involved in providing networks to the Sector, e.g. regional management organisations – DHBs, MSOs, network vendors and digital certificate management authorities.

Refer also to the list of issues facing the infrastructure of the National Network in the Questions Raised section.

3.4 Linkage to other Action Zones

Introduction

Collaborative information sharing across the Sector requires the ability to connect to a secure National Network. Connectivity in the Network is required if benefits such as more coordinated care, greater knowledge sharing and collaboration among practitioners are to be realised, as well as the provision of more robust evidence to support policy and funding decision-making.

The Health Network is an Enabling Zone, upon which the other Action Zones depend. Refer to the diagram below, for an illustration of the relationship between HIS-NZ Action Zones. All Action Zones require a robust and secure Network to transport messages and transactions.

The following summary of linkages is not exhaustive.

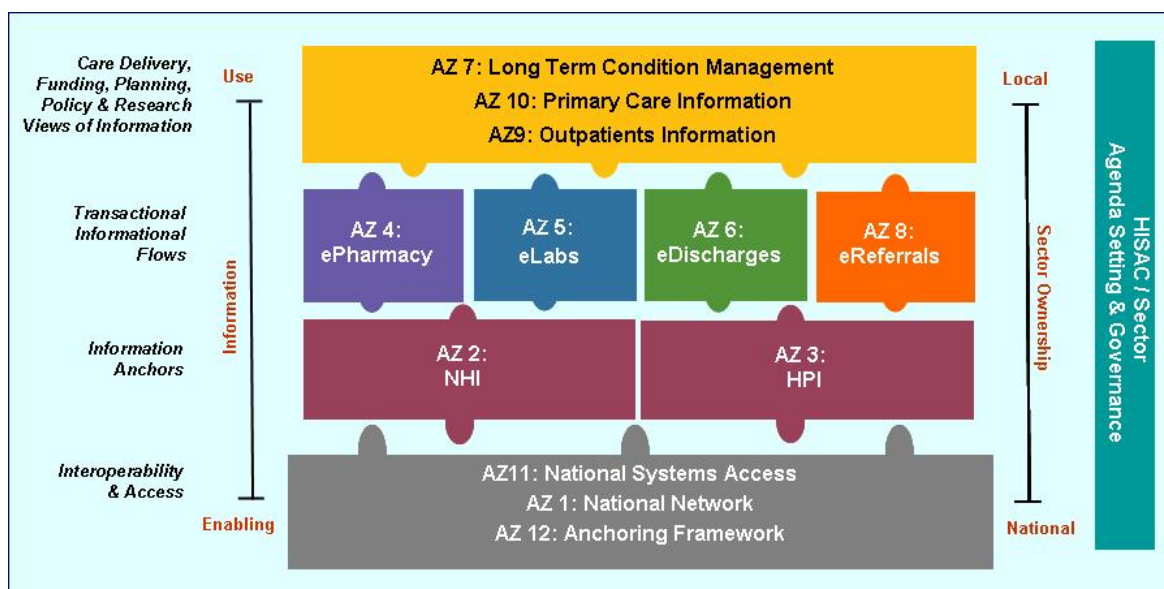


Figure 3: Action Zone 'Jigsaw'

Action Zone 3 – HPI Implementation

The Health Practitioner Index (HPI) Strategy for Action Zone 3 suggests that the HPI will be used to:

- Control access to health care systems and information through each practitioner's unique identifier, role and scope of practice;
- Confirm the identity and attributes of practitioners and detect where they engage in activities for which they are not qualified.

Action Zone 12 – Anchoring Framework

In their Initial View for Action Zone 12, HISAC commits the Sector to: Develop and implement a framework for the identification, prioritisation, coordination and governance of key enablers for information sharing and interoperability within the Sector, including (but not limited to) standardised architectural and data models, business processes, information technologies and usage principles and policies.

The Key Features of Action Zone 12 will be supported by a National Health Network community whose participants can easily, effectively and reliably communicate over a secure Network in a secure environment.

These Key Features, relating to the flow of health information around the

Sector, include:

- The Health Information Hierarchy, which is a model for shared distributed health information, including principles and conceptual architectures for information capture and sharing;
 - Health Event Summaries, related to individuals' and patients' health care events, are the starting point for improved information sharing across the Sector;
 - The Interoperability Framework defines the standards, policies and information specifications enabling meaningful, secure, consistent, reliable and cost effective capture and sharing of information.
-

4 Key Actions to Achieve the National Network Strategy

4.1 Current Actions

Summary

'Current Actions' comprises two actions that can be commenced immediately and deliver benefit to the Sector in the short to medium term. These 'Current Actions' are:

- Under the umbrella of 'business as usual' the Sector should be looking to increase connectivity to the existing Health Network to support immediate progress in other Action Zones, e.g. start getting pharmacists on-line. HISAC will work with Sector organisations to support connecting them to the Health Network. Organisations may be selected according to:
 - The extent of their involvement in the enabling Action Zones;
 - How readily they could be connected to the existing Network; and
 - How readily they could be migrated to an upgraded Health Network.
 - The Sector has identified that a Sector directory and secure e-mail are services that will provide significant added value to Network users in both the short and the long term.
-

4.2 Future Actions

Summary

'Future Actions' includes planning and policy actions that will potentially deliver most benefit to the Sector over the long term. These 'Future Actions' are:

- Review the Health Network Code of Practice. HISO have already planned a review of the Health Network Code of Practice. The updated Code of Practice must:
 - Reflect the requirements of the updated Privacy, Authentication and Security framework;
 - Focus particularly on the aspects related to Digital Certificates and Encryption, which have come in for comment and criticism during discussions with the Sector; and
 - Consider the recommendations made by the Cisco team in developing the NGHN architectural documents.

Any specific technical standards will be moved from the Code of Practice document itself to a related schedule that can be more easily changed and managed.

- Review the initial NGHN deliverables and the role of the existing Health Network, taking into account the issues in the 'Questions Raised' section.
- Create a technical design and an action plan that meets the requirements of the Network strategy, the updated Code of Practice, and the NGHN work to date.

Refer to Figures 4 and 5 below for illustrations of the implementation of these Key Actions and possible ownership of them.

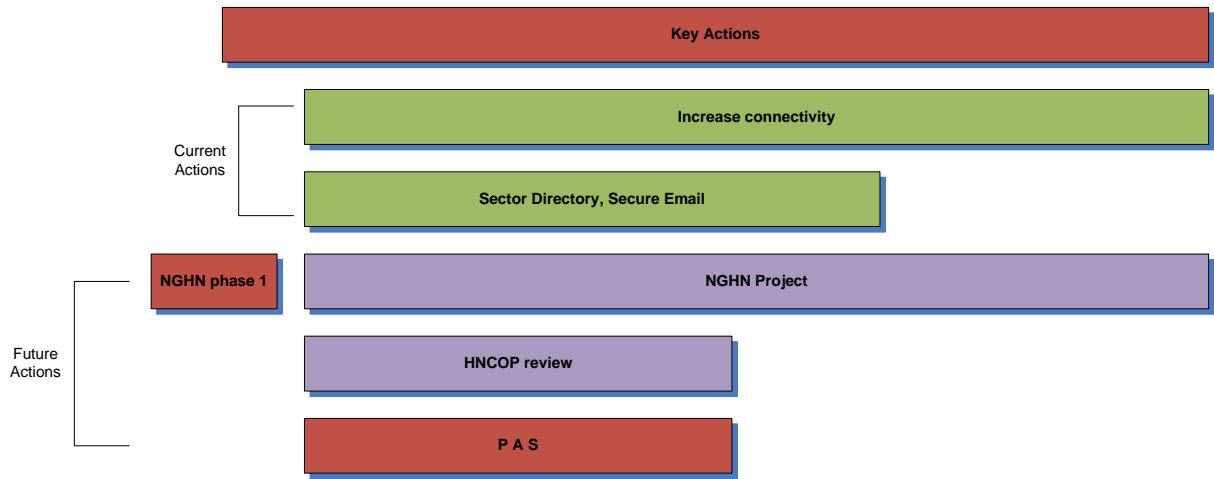


Figure 4 Implementation steps by workstream

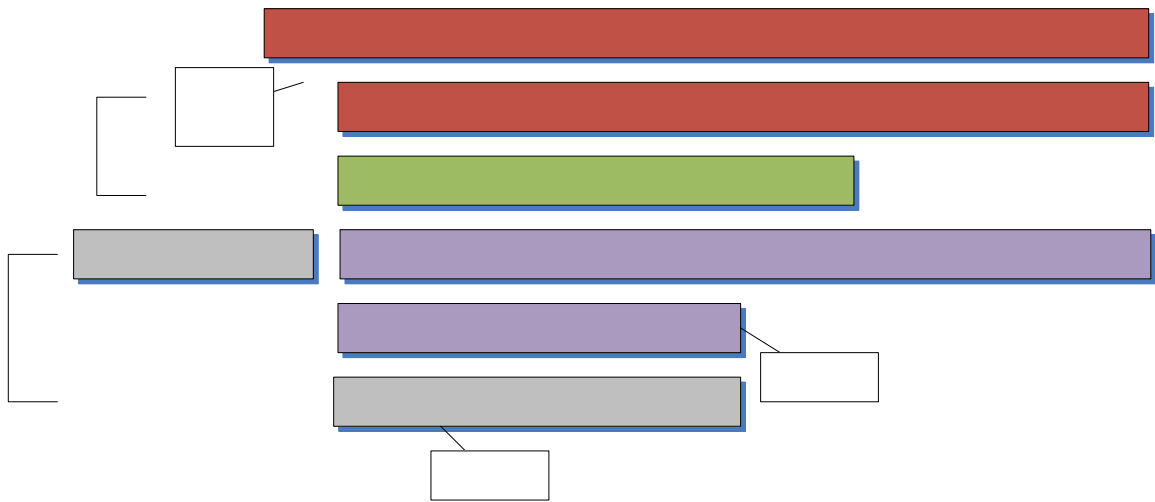


Figure 5 Possible ownership of implementation steps

5 Stakeholder Benefits

This section contains a summary of the benefits expected to accrue for each stakeholder group.

Moving the Sector forward

HIS-NZ has represented the degree of automation of different elements of the health Sector with the 'thermometer' diagram, below.

National organisations – the Ministry of Health, ACC, secondary care organisations, DHBs, and a proportion of primary care practitioners (mainly GPs) are currently using the Health Network.

Making changes to the Health Network as outlined in this PS&A document will, by increasing the number of care practitioners connected to the Network, enable a significant improvement in the level of automation in primary care, community organisations and Long Term/Residential care services.

Value added to these organisations will come mainly from the services that can be delivered across the Network, instead of from the Network itself.

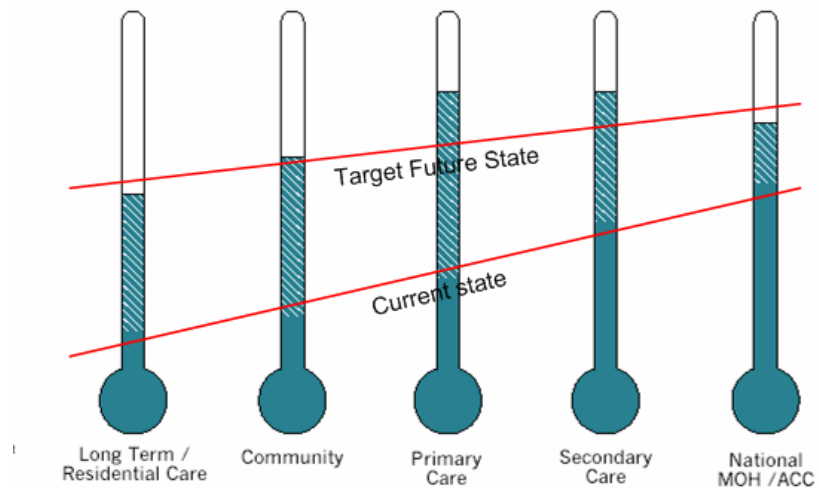


Figure 6: Information use 'thermometer' diagram

Patients

The Health Network is an enabler of change, providing caregivers with better access to information and a greater ability to work together. Patients will experience benefits as the Sector changes the way that it works and uses information, by:

- Improved collaboration between health practitioners leading to better coordination of care.
- Patients receiving better value from a Sector that has access to accurate information when it is needed, to support their treatment and services associated with it.

Care Practitioners

The Health Network is an enabler of change by care practitioners, not a creator of change. Care practitioners must create their own momentum, and they will be able to use the upgraded Network to improve the care that they provide for their patients, by:

- Communicating more rapidly, efficiently and effectively with all Sector stakeholders, in particular ensuring consistency of information and that health workers are working with up-to-date information;
- Sharing more information and knowledge, making information accessible where and when it is needed in a secure and reliable manner;
- Enabling health practitioners and patients to remotely access their

information in a secure manner (e.g. from home);

- The effective delivery of eLearning and other on-line services to assist and support rural health provision.
-

Organisations (DHBs, MSOs, NGOs, PHOs)

The Health Network is an enabler of change for organisations. The Network will provide opportunities for organisations to change the way their business operates, through better communication with both care organisations and funding agencies, through:

- Potential cost savings from the ability to increase the speed, efficiency and effectiveness of systems, together with a reduction in paper-based transactions;
 - A wider scope for the development and deployment of more (and enhanced) user applications;
 - Increased innovation in health care delivery.
-

Funding Agencies, Policy Advisors, Researchers

The Health Network is an enabler of change that will allow information to flow at a greater speed and in a more managed fashion around the Sector. Funding agencies, policy advisors and researchers will experience benefits as the Sector changes the way that it works and uses information. The following factors may apply:

- An action plan for the Health Network, agreed by all participants, will allow organisations to plan for and embrace Network-enabled change;
 - Increased ability to deliver on strategies requiring Sector collaboration, information sharing and improved information delivery at the point of care;
 - Researchers will be able to analyse more and better information as the concepts inherent in the Health Information Hierarchy and Health Event Summaries (Key Features in Action Zone 12) are adopted, with different views of data being made available for access via the Health Network.
-

5.1 Indicators of success

Introduction

At a high level, the progress in Action Zone 1 can be measured by the perceived value that the Health Network brings to the Sector. At its simplest this could be measured by a survey of Network users.

A more scientific indicator could be calculated based on a formula that includes:

- The number of connections to the Health Network;
 - The perceived value that the Network brings to health businesses; and
 - The ease of use of the Health Network and applications.
-

Number of connections

The 'number of connections' indicator could be calculated according to a formula that includes:

- The number of practitioners connected;
 - The number of Sector organisations connected;
 - The number of services being delivered across the Network; and
 - The reduction in non-Health Network networks and services being used.
-

Perceived value

The 'perceived value' indicator could be calculated according to a formula that includes:

- The total dollar cost of health networking;
- The number of services being delivered across the Network; and
- The number of transactions/volume of data being carried by the Network.

Ease of use

The 'ease of use' indicator could be calculated according to a formula that includes:

- The reliability and robustness of the network;
- The effectiveness of Network administration and support processes;
- The pervasiveness of the identity management and authentication processes.

Appendix A Stakeholder Engagement

The following stakeholders were interviewed during the consultation exercise that led to this document:

HISAC	<ul style="list-style-type: none">• Tony Cooke – CIO at Hutt Valley District Health Board
DHB	<ul style="list-style-type: none">• Paula Campbell - Project Manager at Hutt Valley District Health Board• Chris Dever – CIO at Canterbury District Health Board• Jo-Ann Jacobson – CIO at Hawke’s Bay District Health Board• John Chambers – Director of Emergency Medicine, Dunedin Hospital• Alex Wheatley – CIO at Lakes DHB• Kingsley Logan – Clinical Director at Taupo Hospital• Jerry Gathcole – Ear, Nose and Throat Specialist. Working in private practice and at Whangarei hospital.
Primary Care	<p>Harley Aish – GP in Otara and Director of Procure Hywell Lloyd, Richard Muir – GP’s at the Mosgiel Health Centre Ram Vara – GP at the Temuka Medical Centre</p> <ul style="list-style-type: none">• Sandra Hicks – GP at Halswell Health• Liz Burns – District Nurse for the West Coast District Health Board based at Moana.• Greville Wood – GP at the Dobson Clinic for the West Coast District Health Board• Charlie Dundas – GP at the Broadway Medical Centre, Kaikohe• Roger Willis & Lisa Hughes – GP’s with the Health Rotorua PHO• Richard Whitney – General Manager, Southlink Health
NGOs	<ul style="list-style-type: none">• Duncan McDonald – Chief Executive, Selwyn Foundation; Ray Delaney, consultant to the Selwyn Foundation.• Eldon McArthur – Communications Centre Manager, St. Johns Ambulance, Christchurch• Alistair Vickers – Information Systems Manager, Plunket Society
Others	<ul style="list-style-type: none">• Murray Tilyard – Professor at Otago Medical School, Executive Director of Southlink IPA• Dave Woods, Rachael Clarke, Ken Harrison, Sarah Kennedy, Alan McClintock, Tony Fraser - BPAC team members

Appendix B Bibliography and references

Many papers, documents and other points of reference were used in the preparation of this document but particular reference was made to:

- The HIS-NZ strategy was the basis of the underlying strategic approach;
- The Health Network Strategy 'Initial View' document developed by HISAC;
- Cisco Systems Advisory Services – High Level Architectural Blueprints;
- Cisco Systems Advisory Services – Architectural Design & Specifications;
- Cisco Systems Advisory Services – High Sector Requirements Definition;
- Ministry of Health – Building a Next Generation Health Network, Current State Diagnosis;
- Standards New Zealand – Health Network Code of Practice.