Health Information Strategy for New Zealand 2005

Health Information Strategy Steering Committee

MINISTRY OF
HEALTH

MANATŪ HAUORA

Foreword

New Zealand is recognised as being at the forefront in using information to support cost effective health and disability services. It is this excellence that will allow us to meet emerging challenges, such as an ageing population, the rising incidence of chronic diseases and the emergence of better though more costly technologies. But to improve our targeting of services in these and other areas we need to draw on the right information in the right place in the right time.

In October 2001 I launched Working to Add Value through E-information, referred to as the WAVE Report, to fuel our capability to use and share health information. WAVE identified challenges to be addressed and priorities for development and good progress has been made against these. It is now time to take stock of our position before moving forward to meet future challenges.

Over the past 12 months a group of people representing the sector has been working on the development of the Health Information Strategy for New Zealand. Led by Chai Chuah, CEO of Hutt Valley District Health Board, this group included representatives from the general practitioner sector, non-government service providers, the Ministry of Health, ACC and also vendors to develop and supply the innovative health management systems for which New Zealand is renowned. I know that they have consulted widely throughout the sector to ensure that all pertinent issues were addressed. The dedication and commitment of these representatives to developing this document has ensured its strategic relevance to all groups in the health and disability sector.

The Health Information Strategy for New Zealand is not just a policy initiative where recommendations can be noted and implementation passed to the IT specialists. This document presents a key business strategy for the sector, as improved health information management is an integral part of achieving health and disability outcomes for New Zealanders. In an increasingly collaborative health and disability sector it is through coordination and sharing that we realise the true value of information – that it grows more valuable as we give it away.

I commend this Strategy to you, and I look forward to the benefits for the health and wellbeing of New Zealanders that will arise from its implementation.

Hon Annette King
Minister of Health

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Executive Summary

What challenges are we facing?

Most developed nations are finding that the level of demand for health care continues to increase while at the same time the mix of services is changing. Often, new services involve more complex technologies and tend to be more expensive. There is an increasing number of options for addressing conditions, including pharmaceuticals and surgery. Consumers are becoming more knowledgeable and living longer, and advances in medicine mean more diseases can now be treated. All of this further increases the demand for our limited health and disability resources.

New Zealand too faces significant pressures to provide more and better health care delivery. We have:

- an ageing population, which will increase the pressure on our health sector

- rising incidences of chronic diseases such as diabetes and cardiovascular disease

- the re-emergence of some diseases

- the emergence of new infectious diseases such as Severe Acute Respiratory Syndrome (SARS)

- new technologies that are making more effective treatments available, often at higher prices.

Spending on health care in developed countries ranges from 7 to 10 percent of Gross Domestic Product and is threatening to climb still further. New Zealand does not have the resources to continuously increase spending on health care delivery, and we therefore have to focus on managing with limited budgets.

Like other developed nations, we have adopted a strategy of focusing on population health, wellness and prevention. In particular we have chosen to focus on primary care, to reduce the incident rate of serious illness and demand on secondary care services. By focusing on primary care, we can catch disease processes earlier, as well as target the most relevant population groups more effectively. New technologies and approaches are also enabling conditions that previously required a hospital setting to now be managed in a primary care setting.

Given these challenges, we need to target and prioritise our investments in health and disability services so that the limited resources we have are able to maximise the health and participation outcomes of all New Zealanders.

What role does information play?

To get better outcomes for New Zealanders, the delivery of health and disability services in New Zealand needs to focus on working 'smarter'. If we want to work 'smarter' then better information is our lifeblood.

To make effective, informed decisions about targeting services, we need quality information. Decision-making occurs in all areas of the sector, and appropriate information needs to be available at the right time and place and in the right format.

- **Consumers** and their advocates need information to make informed choices about health and independence.

- **Care providers** need to make informed decisions at the point of care, relying on evidence-based service delivery options for their consumers.

- **Provider organisations** must be informed about what constitutes good practice and how they can configure services to achieve the best outcomes for their population; they need to share information with other care providers to provide effective, multi-disciplinary care.

- **Funders** must have information about the health status of their population, what services should be provided, and how effectively services are delivering desired outcomes.

- **Policy makers** and **researchers** must develop knowledge of epidemiological trends and identify interventions that will have the biggest impact on improving health and participation outcomes of all New Zealanders.

Health services are evolving to become more team based and collaborative across the continuum of care. This means there is an increasing need for providers to share more health information safely. While this will help clinicians to make better decisions, we must at the same time continue to ensure an individual's privacy is respected. In a sector highly reliant on trust, we must ensure that trust is maintained.

To enable safe, accurate and timely communication of health information, we need standards. Without standards, the abbreviations, codes, terms and processes used by one service provider may differ from those used by another service provider. Standards are a vital component in building systems that allow us to share information effectively.

If we do not share information and collaborate, then we are at risk of duplication, wastage and even worse, inappropriate service delivery.

Where does the Health Information Strategy for New Zealand fit?

The *Health Information Strategy for New Zealand* (HIS-NZ) provides a context to support the New Zealand Health Strategy and the New Zealand Disability Strategy to use information in innovative ways to improve the health and independence of New Zealanders. It also builds on previous national health information strategies, including the 1996 *Health Information Strategy for the Year 2000* and the WAVE[1] Project.

HIS-NZ was developed under the guidance of a sector-wide Steering Committee that was chaired by the DHB Chief Executive Officer (CEO) Information Group chairman. The Committee included representation from primary care, non-governmental organisations (NGOs), the Health Information Standards Organisation (HISO), ACC and the Ministry of Health.

HIS-NZ provides a direction for the health and disability sector to make better decisions about how to improve the quality and availability of health information. It identifies what we need to focus on and the building blocks that we need to have in

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[1] *The Working to Add Value to E-Information (WAVE)* report published the findings of a team drawn from a large number of participants in the New Zealand health and disability sector to survey and analyse the current state of health information management in New Zealand in 2001 and to set priorities and make recommendations.

place to create more effective and efficient working solutions. The linkage between health strategies, particularly the New Zealand Health Strategy and its priorities, and information strategies is illustrated in the Figure 1 below.

Figure 1: Linkage between health strategies and information strategies
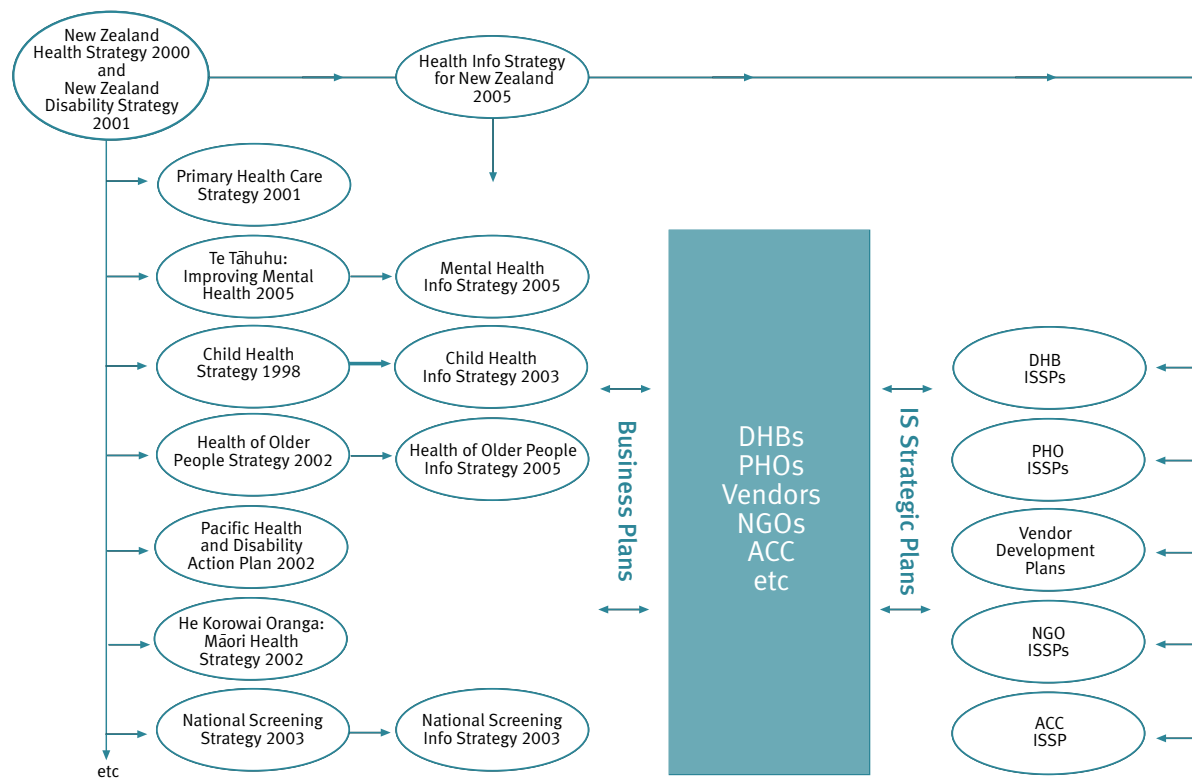
New Zealand made early strides in recognising the value of information systems in improving health outcomes through the implementation of a national infrastructure.

As the rest of the world rapidly catches up, we need to rise to the next round of information system challenges for improving the health and wellbeing of New Zealanders.

In addressing new opportunities for information systems to contribute to improving health outcomes, we need to realise that different parts of the sector have very different levels of information systems capability. Community providers tend to have less capability than primary care providers. Secondary care providers, District Health Boards (DHBs) and national agencies such as the Ministry of Health and Accident Compensation Corporation (ACC) are comparatively well computerised in delivering clinical services and for administrative processes.

We must not re-invent the wheel when it comes to either public sector or private organisations making investments in complex information systems. Duplicate or conflicting solutions implemented in different organisations across the sector will mean we are unlikely to achieve true collaboration or economies of scale. HIS-NZ plays a crucial role in ensuring this does not occur.

What will the health and disability sector do?

Chapters 3 to 6 of HIS-NZ identify principle interventions that provide a linkage to major health and disability sector strategies and priorities that reflect areas where action is needed. For each of the priorities, 'action zones' provide a focus for implementation planning in the sector over the next 3 to 5 years.

The action zones are:

1. National network strategy
2. NHI promotion
3. Health Provider Index (HPI) implementation
4. ePharmacy
5. eLabs
6. Hospital discharge summaries
7. Chronic care and disease management
8. Electronic referrals
9. National outpatient collection
10. National primary and community care collection
11. National system access
12. Anchoring framework.

Chapter 7 onwards of HIS-NZ discusses the specific guides for building the capability that we need to create workable solutions. These 'building guides' outline the key structural components required to deliver integrated information systems to the sector. The eight building guides are:

1. Investment management framework
2. Strategic information planning framework
3. Collaboration frameworks
4. Data sets
5. Applications
6. Networks
7. Standards
8. Privacy and security.

How will we go about it?

At present, health and disability organisations are at different stages of evolution in their use of information systems and technology to manage health information. As a sector, we have to support those with less developed capability so that they can evolve, while at the same time allowing more capable organisations to continue to evolve.

Benefits realised from better use of information, and improved capabilities from an advance in development, should encourage organisations to evolve of their own accord. Making the transition from one evolutionary stage to the next is more difficult where stages involve multiple providers. Action zones therefore particularly target those activities that require multiple organisations to come together for the benefit of the consumer.

Internationally, there is a growing realisation that a single electronic health record (EHR) that ties together everything in one physical repository is neither a panacea nor practicable, affordable or achievable. The more successful overseas models are adopting 'distributed' EHRs where information may be spread throughout many different physical information systems. Information is linked and can be referenced electronically, so that when a clinician is making a decision about care, relevant and appropriate information about the patient, and what has been done in the past, is readily available at the point of care.

HIS-NZ envisions EHR distributed at local, regional and national levels, with the richest and most detailed information about a consumer kept locally. HIS-NZ has discounted a single national repository EHR for all an individual's identifiable health information.

The focus of HIS-NZ is on the communication and connectivity required for the sector to use and share this distributed information in a manner that leads to better health and participation outcomes. If New Zealand can achieve progress in the 12 priority areas described by HIS-NZ, we will have evolved our own distributed EHRs by focusing on practical solutions that deliver value to consumers and their care providers.

How will we know when we are successful?

HIS-NZ sets specific benchmark targets that are achievable over the next 3 to 5 years. Achieving these will enhance the interface between primary and secondary health care, as well as improve the overall level of information sharing and collaboration across the sector.

In 3 to 5 years' time, New Zealand should be able to see a number of advances.

- Community providers will be connected to a secure health information network. This will support more seamless care, enabling them to participate in information sharing and in accessing relevant data as it becomes available to the different initiatives.

- All parts of the sector will be able to access relevant key event summaries online.

- Primary care and secondary care providers will interact electronically around key events, discharges and chronic care/disease management.

- There will be greater collaboration and sharing of information between hospitals, general practitioners, diagnostic service providers, pharmacies and other practitioners.

- Interactions between secondary care and primary care providers will be more uniform. Routine exchanges of information such as discharge summaries, referrals and admissions for services should be the norm.

- At a national level, key information gaps in our existing collections will have been closed, particularly in regard to understanding:

  – community, primary care and outpatient services; access to these data sets will be nationally enabled, supporting safe and high-quality care to consumers

  – the implications of our health strategies from a policy, funding and research perspective; we need to be able to monitor progress and evaluate the outcomes of changes to our service configuration.

The benchmark targets identified by HIS-NZ are a *minimum* for each part of the sector

and are not intended to limit any particular organisation that chooses to evolve further, or faster. Some organisations in each part of the sector will exceed these targets and provide leadership for their peers as they evolve at a faster pace.

What are the benefits?

Implementation of HIS-NZ will lead to a health and disability sector where:

- **consumers** will receive care that is targeted to their health needs and provided in a co-ordinated way as their care providers are better informed of existing issues and are able to communicate more easily. Consumers can also be more directly engaged, by electronically interacting with providers, where appropriate

- **care providers** will make more informed decisions at the point of care because relevant patient information will be more accessible and they will have immediate access to evidence-based knowledge on which to base their interventions. They will be able to collaborate with other professionals through shared systems and data around chronic conditions and disease management programmes

- **provider organisations** will be able to configure services to achieve the best outcomes for their population because they will be better informed about the health status of their populations

- **funders** will have information about the health status of their population, what services should be provided and how effectively services are delivering desired outcomes. This will enable them to target services more selectively, as well as being able to analyse population health and disability data

- **policy makers** and **researchers** will be able to identify what interventions will have the biggest impact on improving the health and participation outcomes of all New Zealanders

- **information system vendors** will be more able to deliver systems fit for purposes aligned to strategic priorities.

HIS-NZ will also signal to other sectors such as education, social services and e-government where the health sector is heading through clear priorities and activities.

Most importantly, we will be able to assess whether our major health and disability care strategies are paying dividends through improvements in overall population health and reduced disparities in health status.

How do we fund implementation?

Implementing the identified action zones from HIS-NZ will required focused effort and resources. This in turn requires a managed approach to investing people, time and resources – from both public sector and private organisations – in development and implementation.

Finding the resources to take action does mean that the sector as a whole needs to take responsibility for implementation.

1. All sector organisations spend money on information systems. Re-allocating existing capital spending towards the prioritised action zones is a key element of implementation. This does not mean that action zones will be the only things that get done, but it does mean that other investments may receive lower priorities.

2. Action zones provide a reference point for all organisations in the sector to use in

future planning. Money that has been set aside for other future projects can be directed toward new action zones projects.

3. The allocation of new money where it is made available, based on the merits of specific initiatives and their business case, plays an important role in seeding implementation and facilitating collaboration among stakeholders.

Next steps

There are three key recommendations of HIS-NZ.

1. That a governance group be established with appropriate resources and made accountable for providing oversight of HIS-NZ implementation. This group may not necessarily be a new entity, but will need to:

    a. ensure wide buy-in to HIS-NZ through whole of government and all parts of the sector, including community providers

    b. represent both public and private interests in the sector

    c. ensure transparency and co-ordination of HIS-NZ implementation

    d. work with the Ministry of Health to facilitate and co-ordinate activities, identify triggers for when to refresh HIS-NZ and report to key stakeholders on implementation progress.

2. That planning activity be started for each of the 12 action zones including:

    a. identifying key constituencies impacted by each action zone

    b. identifying key tasks required for implementation

    c. identifying potential funding streams for each action zone

    d. developing business cases for action zones that require investment, particularly those that may require collaborative funding by a number of stakeholders.

3. That the building guides continue to be developed to guide the effective use of information in the sector.

1 Introduction

Health information must support the delivery of health care. The *Health Information Strategy for New Zealand* (HIS-NZ) will provide a context to support the New Zealand Health Strategy and the New Zealand Disability Strategy in using information in innovative ways to improve the health of New Zealanders.

The purpose of HIS-NZ is to develop a single and co-ordinated strategy for information systems, including current and emerging information, communications and technology (ICT) within the health and disability sector. The process aims to develop consensus on vision, goals and activities for information systems in the sector over the next five years.

1.1 Relationship to other information system planning activities

HIS-NZ builds on previous national health information strategies, including the 1996 *Health Information Strategy for the Year 2000* and the WAVE[2] Project. It also builds on existing local and regional information technology strategies.

HIS-NZ uses the ICT strategic planning framework developed by the Ministry of Health and DHBs over the past 12 to 18 months, and has focused on developing the national components of this framework so as to:

- maximise national co-ordination and collaboration across the sector
- maximise the return from information-related investment, particularly across all DHBs
- ensure that national requirements are met.

1.2 Engagement process

HIS-NZ was developed under the guidance of a sector-wide Steering Committee that was chaired by the DHB CEO Information Group chairman. The Committee included representation from primary care, NGOs, the HISO, ACC and the Ministry of Health.

Engagement with the sector was sought in a number of ways.

- Face-to-face interviews were held with representatives of key sector organisations.
- Preparatory planning took place, involving DHB Chief Information Officers (CIOs) and the DHB CEO Information Group.
- The sector-wide Steering Committee provided ongoing reviews as well as overall strategic direction.
- Input was sought via stakeholders' meetings, including representatives from laboratory, pharmacy, aged care, NGOs, primary care, DHBs and public health.
- Regional workshops were held to identify issues, priorities, opportunities and to validate draft material.

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[2] *The Working to Add Value to E-Information (WAVE)* report published the findings of a team drawn from a large number of participants in the New Zealand health and disability sector to survey and analyse the current state of health information management in New Zealand in 2001, and to set priorities and make recommendations.

- Online web-based and simultaneous teleconferences were held to validate and test regional workshop input.

- The draft HIS-NZ was sent out to representatives of key sector organisations for final validation.

1.3   Future updates of HIS-NZ

HIS-NZ proposes that a governance body manage and monitor implementation and take responsibility for reviewing the strategy. The governance body will monitor implementation progress annually and review HIS-NZ's five-year strategic priorities to ensure their alignment with evolving major health strategies.

2   What is the Case for Change?

2.1   Global trends in health care

Health services in most developed nations are finding that the level of demand continues to increase while at the same time the mix of services is changing. Often emerging new services involve additional and more complex technologies and tend to be more expensive. Consumers are becoming more knowledgeable and living longer, and advances in medicine mean more diseases can now be treated. All of this further increases the demand for our limited health and disability resources. There are a number of emerging trends.

- **Epidemiological changes** – a mounting burden of chronic diseases such as diabetes and cardiovascular disease; the return of old infectious diseases and the discovery of new ones; an increase in incidence of mental illness; and the increased impact of lifestyle and behaviours on health outcomes. Chronic disease accounts for 60 percent of the global disease burden,[3] with estimates that the burden will grow to 80 percent.

- **Demographic changes** – an ageing population worldwide, but some countries affected more than others – particularly those countries with low rates of immigration, increased life expectancy and lower birth rate; evidence that ethnicity has an impact on health outcomes independent of socioeconomic status.

- **System structure changes** – developed countries spending about 7 to 10 percent of Gross Domestic Product on health; a blurring of barriers between private and public; increased recognition of a need for rationing; evolution of health policy worldwide (focus on prevention, social versus privately funded models, etc).

- **Workforce changes** – global labour market; shortages in more and more professional groups; difficulties in recruiting and retaining workers in the area of home support and home care; increased regulatory activism; changes to scope of practice.

- **Service delivery changes** – steady growth of acute services; decreased focus on inpatient stays with corresponding rapid growth of outpatients and day-stay; pharmaceutical advances based on genetics; new equipment and technology advances being made such as robotics and nanotechnology.

- **Changes in consumer expectations** – increased sophistication, greater empowerment, increased longevity and assumptions of continued active lifestyles increasing the demand for multiple interventions, such as hip and knee replacements; a growing interest in alternative and complementary medicine; awareness and focus on patient rights.

2.2   How health care trends affect New Zealand

New Zealand, like most other countries, faces significant pressures to provide more and better health services while overcoming similar obstacles.

We have an ageing population that will put increasing pressure on our health system. We also have rising incidences of chronic diseases such as diabetes and cardiovascular disease. At the same time, we have the re-emergence of some diseases that tend to be

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[3]   Source: World Health Organization, *Innovative Care for Chronic Conditions: Building blocks for action.*

associated with poor socioeconomic conditions. In addition to this, we face the same threats the rest of the world is facing, with the emergence of new infectious diseases such as SARS and epidemics of existing diseases such as meningoccocal disease.

New technologies are making more effective treatments available, often at a high price. With increasing avenues of communication such as the Internet, New Zealanders are also more aware of treatment options that have been developed here and overseas. This has raised expectations that these treatments will be available to New Zealanders. There is more and more information available to clinicians to use in making decisions. Rapidly changing and expanding 'best practice' is making it increasingly difficult for clinicians to use this information effectively.

Spending on health care in developed countries is approaching 7 to 10 percent of Gross Domestic Product and is threatening to climb still further. New Zealand does not have the resources to continuously increase spending on health care delivery, and we therefore have to focus on managing with limited budgets.

Like other developed nations, we have adopted a strategy of focusing on population health and wellness and disease prevention.

In particular, we have chosen to focus on primary care, to reduce the progression to serious illness and demand for secondary care services. By focusing on primary care, we can catch disease processes earlier, as well as target more effectively the most relevant population groups.

We have also chosen to focus on specific populations with identified high health needs. We need to prioritise our investments so that our limited resources generate the maximum benefit for the health and independence of New Zealanders.

New Zealand has developed a number of health care strategies to address growing demand and to direct the delivery of services to those most in need.

• The **New Zealand Health Strategy** and subsequent update put a focus on preventing high-cost diseases, educating New Zealanders to look after their health, giving equal access for all New Zealanders and implementing the Primary Health Care Strategy.

• The **New Zealand Disability Strategy** aims to eliminate barriers by educating the wider society on disability issues and by maximising opportunities for disabled to contribute.

• **He Korowai Oranga: Māori Health Strategy** aims to reduce inequality through specific Māori initiatives, and by fostering Māori community programmes and monitoring health states and outcomes of the Māori population.

• The **Primary Health Care Strategy** focuses on managing populations (through prevention rather than just treatment), co-ordinating across providers (to prevent duplicating effort in different settings) and having sufficient information for a complete view of high-cost diseases.

• The **Mental Health Blueprint** aims to reduce the impact of mental disorders on consumers, their families, caregivers and the community by increasing services and developing the required infrastructure.

• The **Child Health Strategy** encourages a greater focus on health promotion, prevention and early intervention. This requires better co-ordination between providers and the ability to research trends.

- The **Health of Older People Strategy** requires support for older people and their families to make well-informed choices about healthy living and health care support. The strategy encourages development of integrated health and disability services, in particular proactive primary and community-based initiatives to maintain the health of older people.

- The **Pacific Health and Disability Action Plan** puts a focus on child and youth health and on promoting healthy lifestyles and wellbeing through preventive services and the ability to research trends.

- The **National Screening Unit Strategic Plan 2003–2008** aims to reduce the impact of key diseases and reduce inequalities in health status mainly by encouraging healthy lifestyles and providing a better analysis of screening outcomes.

It is important for business planning to drive the need for information systems. The diagram below illustrates the way in which health strategies inform the development of provider business plans, as well as strategic information plans.

As organisations undertake information systems planning activities following on from business planning, HIS-NZ provides a guide as to national priorities and considerations.

Figure 2: Linkage between health strategies and information strategies
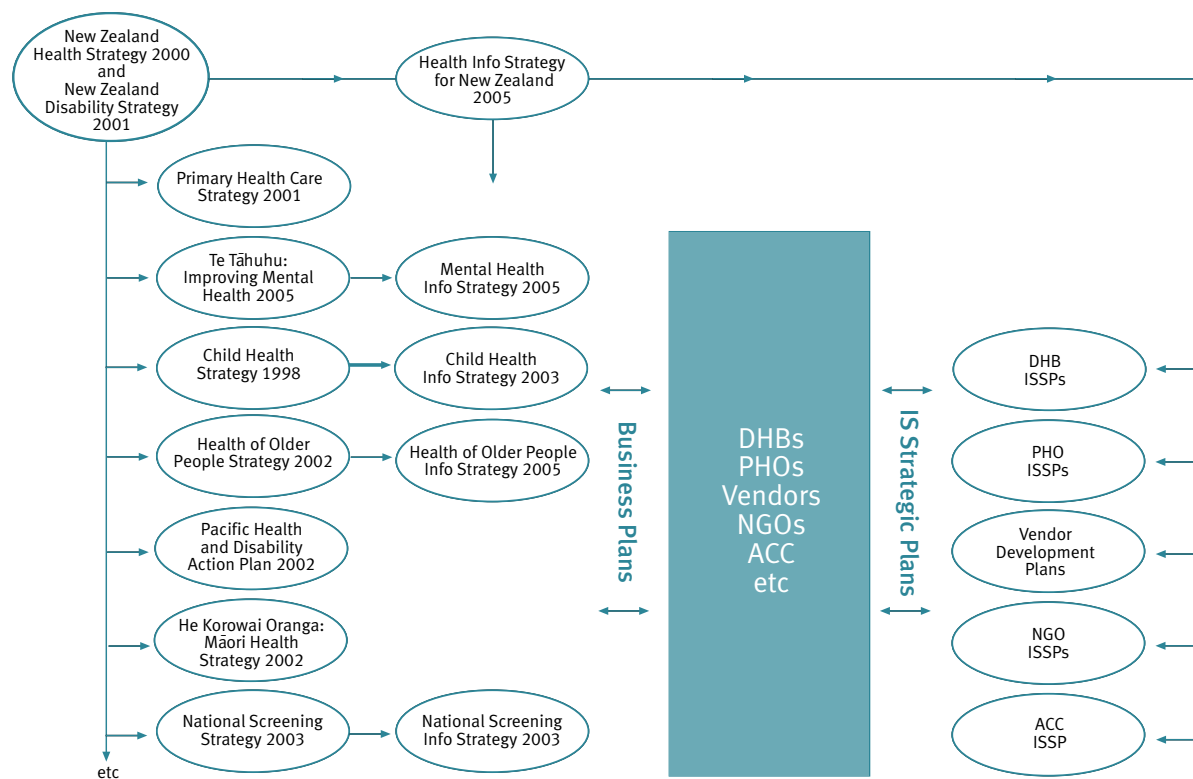
Clearly many of these strategic initiatives are long term and require significant capabilities for successful implementation. We will require investments in capabilities such as our **workforce** (including clinical and information systems skills), our health care **facilities** and our **information systems** in order to achieve what we have set out to do.

HIS-NZ provides a context for increasing our information systems capability. Since we will always face resource constraints, the delivery of health and disability services in New Zealand needs to focus on working 'smarter'. If we want to work 'smarter' then information is our lifeblood.

The following section overviews how information systems are being developed elsewhere in the world.

2.3   Global trends in health information systems

As in other sectors, investment in information systems is rising in the health and disability sector. Information systems play a significant role in helping to improve health outcomes and decision-making at the point of care, as well as in the planning and funding of care.

There are a number of global themes that emerge regarding the use of health information systems.

- **Development of electronic health records** – Various forms of electronic health records (EHRs) are used to convey clinical information, as well as to co-ordinate care for particular diseases or services.

  There is growing recognition of the need for common 'anchors', such as unique identifiers that enable EHRs to span the continuum of care.

  Despite early promises, there is an emerging realisation that a single integrated record is neither workable nor practicable. Most countries are seeking to link multiple pockets of electronic health information into some sensible formation to help provide better and safer care.

  EHRs are recognised as a virtual concept that relies on a network approach, where data is pulled together from multiple data stores. It is no longer viewed as a single physical repository.

- **Use of decision support tools** – There is an increasing demand to support clinician decision making. Support is required at service level (eg, service planning, peer review, trends in medication error) and patient level (eg, care plans, individual clinical actions, service orders).

  There is growing use of decision support tools for computerised physician order entry (CPOE) and nurse order entry (CNOE) and a lot of interest in e-prescribing and formularies.

- **Recognition of need for connectivity** – There is a general drive toward connectivity in most health care systems and increasing demands for online access that requires greater bandwidth. Adequate security is also needed to support appropriate access to patient records, messages to and from other care providers, access to scheduling systems, or links to pharmacy systems. Increasingly, vendors are offering innovative solutions and applications that are based on high bandwidth communications, such as image sharing.

- **Agreement on common standards and minimum data sets** – All countries collect minimum data sets, usually from hospitals. While there is some agreement on what the necessary data sets are, there is generally a lack of agreement at the detailed level within countries and across countries.

  Worldwide, the models that cover areas such as ambulatory or community care are less mature and robust. Security, privacy and compliance models also tend

to be embryonic. All countries struggle with the need for more consistent and standardised reporting. There is also a need to include all parts of government including education, social services and health.

- **Increasing co-ordination of care in general practice** – There is growing use of more sophisticated practice management systems extending beyond just administrative functionality to include clinical functionality. These systems now routinely provide opportunities to review test results, make appointments and referrals, order prescriptions, and allow for some population-based trend analysis.

  Leaders in the field also support individual care plans and provide a growing range of electronic interactions with the consumer, such as clinician-patient chat rooms, online patient support groups or self-monitoring of things like blood pressure and blood sugar levels.

  There are consistent trends globally to make primary care the main focus of health service delivery. Information technology vendors are therefore focusing more of their research and development budgets into this area.

- **Use of tele-health** – There is support for more community-based or home-based services to be delivered remotely. Many countries are exploring opportunities to provide specialist services to rural and disadvantaged communities from a distance.

  Leading provider organisations are also seeking to deliver care, monitoring and the management of chronic conditions remotely via the Internet. There is a growing range of devices available for use in the home that allow vital signs to be recorded and transmitted electronically to the care provider.

- **Consumer involvement** – Increasingly, consumers wish to make informed decisions around their own care and would like easy access to knowledge. Service providers require better tools to educate and inform consumers, manage care plans and monitor adherence to self-management regimes. Service providers need to integrate available information so that their service delivery can better involve consumers.

- **Managing access** – Most developed countries are facing increased demands on their health care systems and have responded with various initiatives to help consumers access the most appropriate care provider.

  Typically these involve interacting with consumers via the Internet or telephone call centres, so that consumers can be directed to the appropriate facility or level of care.

  Supporting systems often include access to quality information (knowledge bases), nurse-based telephone triage, targeted information at point of care and information about providers (eg, directories).

2.4 How health information systems have played a part in New Zealand

The increasing need for information has led the New Zealand health and disability sector to make considerable investments in information systems.

New Zealand made early strides in recognising the value of information systems to improving health outcomes through the implementation of a national infrastructure.

Our investments in systems such as the National Health Index (NHI) to provide a unique patient identifier, the development of the National Minimal Dataset (NMDS) for inpatient services and other national data set collections for data on cancer and

medical warnings, placed us at the forefront of developed nations. They provide fundamental reference points, or 'anchors' for the safe management of health care delivery to New Zealanders.

The growth of general practice and pharmacy management systems and the increasing use of them for clinical purposes is another area where we made early progress.

Our privacy laws, the creation of the role of the Privacy Commissioner and the development of the Health Information Privacy Code, have led consumers to expect confidentiality and have made providers of services aware of the need to maintain patient trust and privacy.

As the rest of the world rapidly catches up, we need to rise to the next round of information system challenges for improving the health and wellbeing of New Zealanders.

For example, many of the issues identified in the WAVE report can only be solved with co-ordination, leadership and co-operation. We are constrained in our ability to collect, share and exchange data in a secure environment. In some instances, there is no information available. In other instances, we are using manual systems for tasks that should be automated.

We need to increase the willingness of providers to share information with other providers where that will improve the care consumers receive.

Like other developed nations, we lack standards that allow multiple organisations to exchange information – for example, several hospitals are currently developing unique approaches to creating electronic referral systems.

More and more hospitals are looking to use clinical decisions support tools – when a care provider places service orders for a diagnostic test, drugs or a referral, then automated checking for duplication, guidance on best practice or alerts for contra-indications is done at the point of decision.

Given that there is a computer in nearly every pharmacy in New Zealand, care providers are well prepared to be able to exchange prescribing information with pharmacists securely and electronically.

Most general practitioners (GPs) use practice-management systems that help to manage clinical information. Next, we need to build newer capabilities to increase collaboration and communication, for example, transferring a patient's electronic record from a GP to another provider.

A number of areas in New Zealand are geographically isolated, where greater use of tele-health can extend access to services.

Connectivity to an affordable, secure and reliable network is a prerequisite for the New Zealand health and disability sector if we are to increase the level of collaboration and information sharing. Current initiatives such as the Health Network Code of Practice represent good progress. Government initiatives such as the PROBE broadband initiative mean that a larger proportion of providers are able to connect and have the means to share and exchange electronic information securely.

The issues we face are complicated: no one organisation in the health care sector holds all the pieces to solve the puzzle.

In addressing the next round of opportunities for information systems to contribute to improving health outcomes, we need to realise that different parts of the health care sector are at very different evolutionary stages.

- Community providers tend to have less information systems capability. Many have little automation, and where it exists, it is usually for administrative tasks as opposed to delivery of care. To do their job better, community providers need to receive better information about consumers who are transferred into their care and be able to share that information when they refer consumers to other services such as hospitals.

- Primary care information systems are more advanced than those of community providers in that there are now a significant number of GPs using personal computers not just for administrative but also for service delivery processes.

- Secondary care providers, DHBs, and national agencies such as the Ministry of Health and ACC, are comparatively well computerised in delivering clinical services and for administrative processes.

- Information system vendors do not always have the guidance necessary for developing innovative solutions to address sector needs for the data exchange.

The diagram below illustrates the high degree of diversity and variability in the capability and use of information systems within the sector.

Figure 3: Diversity of information system capability across the sector
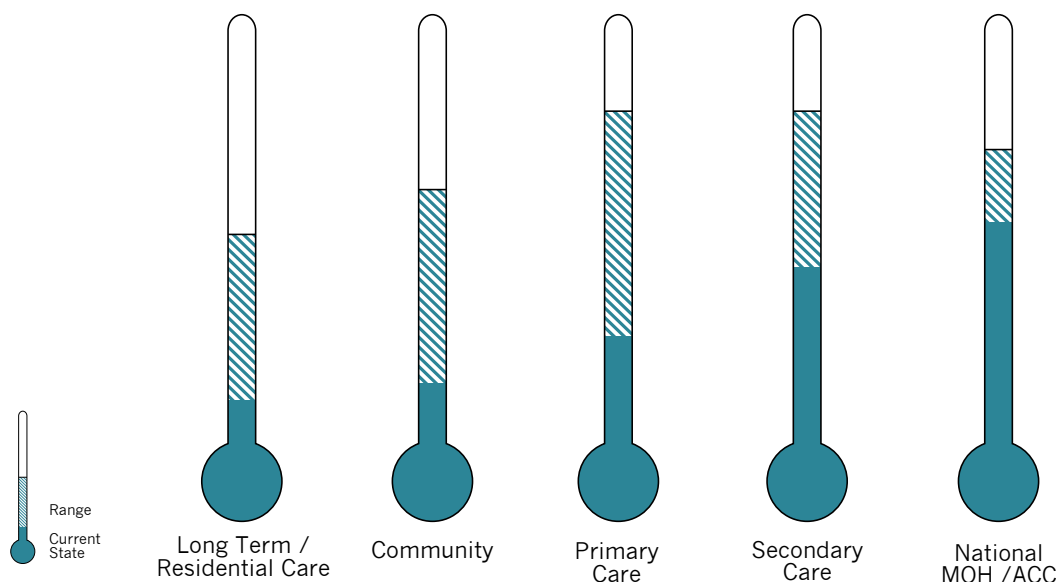
3   What is the Role of HIS-NZ?

3.1   Why do we need a strategy?

Investments in information systems must not be haphazard. Systems that grow by accident will not work as well as those that grow by design, and HIS-NZ can provide this design.

HIS-NZ also helps to balance local needs with national needs. There are trade-offs between centrally directed investment and locally directed investment that reflect different priorities.

Other nations have tried to address their challenges around information systems in a number of ways. Some countries have designed a grand solution for everything and made investments out of very deep pockets. Other countries have tried to mandate particular systems or technologies to their health sectors and created financial incentives and sanctions to comply.

As a small nation, New Zealand does not have the financial resources nor the time to approach information system challenges with a grand plan from the top down. Conversely, when it comes to making investments in complex information systems, we cannot afford to re-invent the wheel and have everybody decide to solve problems in their own unique way.

By comparison, we also have a highly independent and devolved sector. Because decision-making is decentralised, decisions need to be made in a collaborative manner at levels where the relevant expertise exists. To prevent duplication or conflicting solutions being implemented across the sector, a national strategy will ensure that local-level decision-making remains co-ordinated.

We need information systems that are able to communicate with each other. Information system vendors are able to develop innovative solutions to address sector needs. However, guidance is necessary if we want these developments to support the exchange of data across the sector.

HIS-NZ provides a context to support New Zealand health and disability strategies in using information in innovative ways to improve the health and participation of New Zealanders.

It considers the implications for information need and information systems capability of national policy objectives as well as realistically assessing what the organisations and health providers in the sector are capable of.

3.2   How will HIS-NZ support our health strategies?

Information plays a critical role in many of our strategies, and there are a number of challenges in how we use information for planning, funding and providing health care services. Consistent requirements emerge from an analysis of our strategies.

- **Sharing information** appropriately across different care delivery settings is very important for ensuring safe and high-quality care for consumers. A number of strategies are focused on improving the co-ordination between different areas of the sector, in order to improve overall outcomes or to create efficiencies by automating

simple tasks. For example, sharing information between providers improves the quality of care by reducing unnecessary repeat tests and by eliminating the need to repeat information to multiple providers.

- **Analysing populations and diseases**. Determining insights into specific populations and across collections will allow for better decision-making at the point of care, and for more focused funding and planning, and policy development. Such information would also enable preventative activities and therefore need to be able to conduct root-cause analysis. The appropriate information and detail need to be captured if these strategies are to be used to design effective interventions.

- Establishing new **collections and data sets** will help us to identify and manage certain population groups across different care settings. For example, some new collections are for the management of:
  - specific diseases, for example, diabetes
  - new initiatives, for example, immunisation
  - service delivery, for example, outpatients, primary care.

- **Achieving gains in health outcomes** requires data that is currently unavailable in electronic form. All strategies promote an evidence-based approach that measures inputs, outputs and outcomes. Without the right data, the areas of highest need cannot be identified and interventions cannot be targeted.

- **Promoting healthier lifestyles**, providing better health care and disease information, and encouraging greater self-management of care are topics identified in most strategies. We need the ability to share and disseminate information to consumers, so that they are well informed.

Health and disability strategies that focus on a particular disease or population group like the Health of Older People Strategy 2002 are already starting to respond to information-related challenges of that disease or population group. Specific information strategies that focus on the needs of that particular disease or population group – such as the Health of Older People Information Strategy 2005 (in press) – are being developed. We can make considerable gains by more explicitly linking the health care delivery goals of a given strategy to the information elements.

By considering the importance of information to the consumer, clinicians and providers, and funders, and by analysing the information implications of proposed changes and new processes, we can become smarter in our response to the challenges of health care.

3.3   What does HIS-NZ mean for health records?

Internationally, there is a growing realisation that a single Electronic Health Record (EHR) that ties everything together physically in one information system is neither a panacea nor practicable, affordable or achievable.

As a result, the more successful systems are adopting 'distributed' EHRs where information may be spread throughout many different physical information systems, where the information is linked and can be referenced electronically. In this way, when a clinician is making a decision about care for a consumer, the relevant and appropriate information about the patient, and about what has been done in the past, is readily available.

It is important that there is a clear understanding of how New Zealand should manage consumer and client information in the context of a national strategy. National, regional and local information systems need to enable flows of information that support collaborative services centred on the consumer.

HIS-NZ envisions EHRs distributed at local, regional and national levels, with the richest and most detailed information about a consumer kept locally. HIS-NZ has discounted a single national repository EHR for all of an individual's identifiable health information.

The distributed EHRs that HIS-NZ envisages for New Zealand are illustrated in Figure 4.

Figure 4: New Zealand's distributed Electronic Health Records model
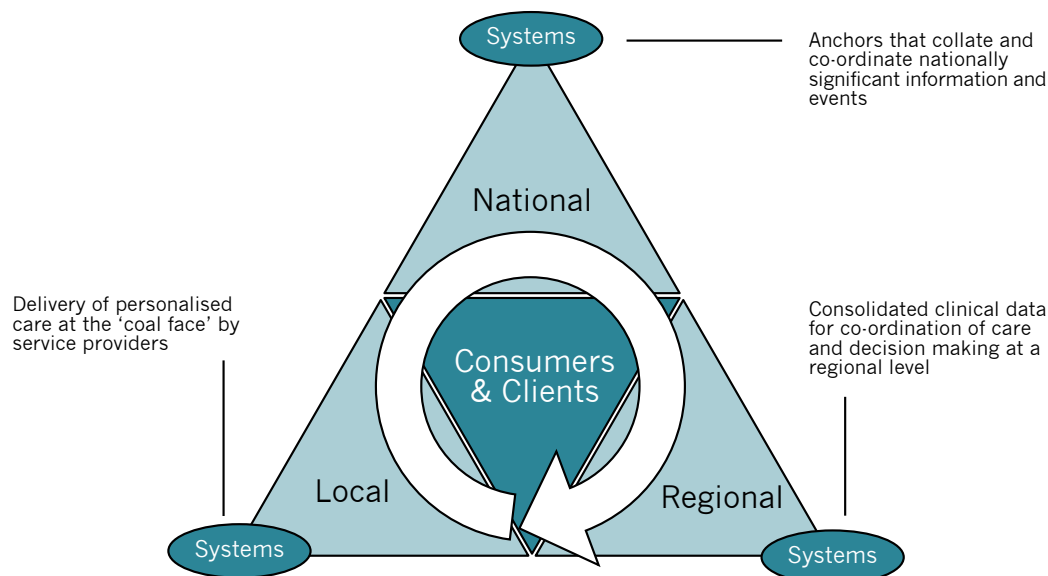
Each group of systems has a role.

- **Local systems** support the delivery of personalised care 'at the coal face' by service providers. These systems have the most amount of detail and carry rich data about a consumer and any given interaction. They help service providers to deliver health care to consumers or disability services to clients.

  These systems are owned and operated by the individual service providers in the sector, such as Primary Health Organisations (PHOs), GPs, dentists, pharmacists, hospitals, residential care facilities or community services providers.

- **Regional systems** consolidate specific clinical data at a regional level for the co-ordination of care and decision-making around service delivery. Typically they provide key event summaries that abstract relevant information from consumer encounters.

- Examples include hospital discharge summaries or disease management applications that support the sharing of data. Business processes around these systems are not necessarily standardised across all of New Zealand, but are at least consistent within each region.

  These systems are owned and driven by regional agencies such as DHBs, shared support agencies and PHOs.

- **National systems** are core systems that provide shared data and consistent business processes to the health and disability sector of New Zealand. They provide reference points and 'anchors' for nationally significant information and events and support a number of clinical safeguards such as the Medical Warnings System (MWS).

Examples for national systems include the National Health Index (NHI), the Health Practitioner Index (HPI) currently being developed, and proposed and existing national collections that support policy analysis (including needs assessment and monitoring).

These systems are owned and operated by national agencies such as the Ministry of Health, District Health Boards New Zealand (DHBNZ) or ACC.

The focus of HIS-NZ is on the communication and connectivity required for the sector to use and share this distributed information in a manner that leads to better health and participation outcomes. If New Zealand can achieve progress in the 12 priority areas described by HIS-NZ, we will have evolved our own distributed EHRs by focusing on practical solutions that deliver value to consumers and their care providers.

3.4 How can information flows be improved?

In order to maximise the benefits for consumers and clients, we must ensure that there are appropriate flows of information between these various systems.

Rich and detailed data is captured in local systems during service delivery. Health event summaries can be created and transferred into regional systems, so that key information is available to other authorised providers. This allows the co-ordination of care and services at the regional level. In turn, national systems may take data either from regional systems or directly from local systems to support population-based decision-making.

In order to achieve this connectivity:

- there must be a secure network linking all parts of the sector – at a national, regional and local level

- we need to provide anchors for sharing information, so that we can use a common language and dialogue in our communications

- we need to extend the collection of health information into those areas where we currently lack vital information to support decision making and targeting

- we need to engage with all stakeholders regarding the better use and sharing of information

- we need to ensure that we deal appropriately with legal and privacy safeguards.

HIS-NZ leads us to a distributed model for electronic health information where information is held at varying levels of detail according to the decisions that need to be supported. For these disparate systems to share information, there need to be anchors such as the NHI system and standards.

3.5 How will HIS-NZ support an evolutionary approach?

At present, organisations are at different stages of evolution in their use of information systems and technology to manage health information. As a sector, we have to support those with less developed capability so that they can evolve, while at the same time allowing more capable organisations to continue to evolve.

The diagram is a technical development model detailing the key evolutionary stages that an organisation typically moves through as it becomes increasingly more sophisticated in its information systems. At each stage an organisation must also develop capabilities in its people, culture and business processes.

Figure 5: Key stages of technical evolution

Automate & Capture

Building blocks
- computers
- internal network
- administrative systems
- clinical / service management systems

Connect & Communicate

Building blocks
- access to email
- access to Internet
- secure connection to a Health Network
- agreed authentication and authorisation

Transact & Contribute

Building blocks
- firewalls
- negotiated access agreements
- messaging capability
- shared data repositories

Orchestrate & Direct

Building blocks
- permanent network connection
- rules engines
- message routing and transaction server
- shared applications

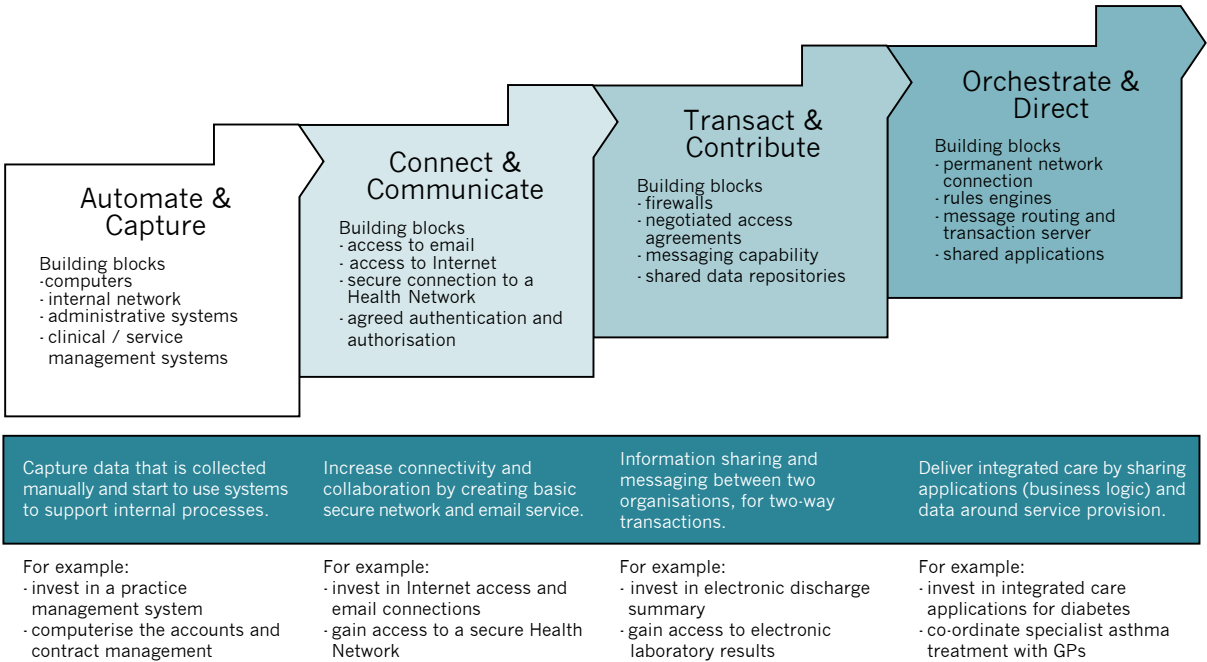| Capture data that is collected manually and start to use systems to support internal processes.	Increase connectivity and collaboration by creating basic secure network and email service.	Information sharing and messaging between two organisations, for two-way transactions.	Deliver integrated care by sharing applications (business logic) and data around service provision.
For example: - invest in a practice management system - computerise the accounts and contract management	For example: - invest in Internet access and email connections - gain access to a secure Health Network	For example: - invest in electronic discharge summary - gain access to electronic laboratory results	For example: - invest in integrated care applications for diabetes - co-ordinate specialist asthma treatment with GPs

Table 1 illustrates some of the benefits to patients, providers and funders that accrue with each step in the technical development model.

Table 1: **Value to patients, providers and funders at each level of technical development**

	Automate and capture	Connect and communicate	Transact and contribute	Orchestrate and direct
Patients	Tell your information only once – less repetition

Have more confidence in the accuracy of your records | Faster turnaround times for services (eg, results of your tests)

Speedier referrals to related services and care providers | Deal with fewer repeated questions as relevant information more available to your care providers

Be more informed when making decisions (eg, what to do after your discharge from hospital) | Have your care better co-ordinated between multiple providers

Encourage a focus on your wellness

Be more involved in your care |
| Providers | Capture only once and reuse

Productivity gains (through automation)

Better management visibility of business activity

Create structured data for analysis | Process efficiencies through faster communication

Smarter business and clinical decisions through access to knowledge

More flexibility in the interactions with third parties (patients, providers and funders) | Process efficiencies through automation of common interactions

Reduced cost by using data that has been collected elsewhere

Better decisions at point of care through the use of clinical data stores

Reduced compliance cost for data submissions

Improved patient satisfaction | Process efficiencies through true collaboration

Ability to orchestrate service delivery with other providers

Lower service delivery costs by reducing the risk of adverse events

Better consumer involvement and participation |
| Funders | Improved accountability

Easier to manage and measure contractual arrangements | Faster payment turnaround times

More responsive contracting supported by faster turnaround of information | Efficiency gains through E-commerce (eg, automated payments)

Better targeting and decision making by using clinical repository information

Reduced compliance costs | Ability to manage risk collectively

Better alignment of incentives through more innovative contracting models

More efficient and effective service delivery |

Benefits realised from better use of information, and improved capabilities that come with an advance in development, should encourage organisations to evolve of their own accord.

Making the transition from one evolutionary stage to the next is more difficult where stages involve multiple providers. The emphasis for action therefore needs to be on those activities that enable multiple organisations to come together for the benefit of the consumer.

In order to support health and disability strategies to make innovative use of information, different actions are required at the different levels of development to support the implementation of the strategy. However, these actions need to be co-ordinated and undertaken in a collaborative manner by the whole sector.

This section has outlined the role of HIS-NZ, documenting the reasons why we need a strategy, its relationship to existing health strategies, and the type of clinical information system required to support health strategies.

HIS-NZ proposes an evolutionary approach to developing a distributed electronic health record, acknowledging that providers are at different stages of development in their ability to participate in the distributed model.

HIS-NZ also acknowledges that further work in implementing information anchors is required. The next section outlines what actions are required to implement the Strategy.

4 What Actions are Required?

4.1 The scope of HIS-NZ recommendations

HIS-NZ deliberately focuses on enabling better use of information *between* service providers across the New Zealand health and disability sector. Better information usage *within* any one organisation is supported by HIS-NZ setting priorities and providing guidelines.

HIS-NZ 'action zones' are areas where effort should be focused over the next 3 to 5 years to implement HIS-NZ. They are a useful way to target activity that is needed to improve information systems capability within the sector.

Action zones allow other government agencies, where required, to work across the health sector strategically by presenting a more unified view of information systems in the sector. For example, dialogue – between housing and disability support, between justice and mental health, or between local government and public health – is vital in making gains in the overall health and independence of New Zealanders.

4.2 How action zones work to improve IS capability

HIS-NZ consultation highlighted that different parts of the sector have different levels of capability in their use of information systems. Depending on their relative level of development, they also face quite different challenges and are likely to evolve according to different priorities. Each organisation, however, needs to take responsibility for their own strategic information systems plans to guide the development of solutions to their unique business challenges.

HIS-NZ action zones balance the need of the sector organisations to evolve from different levels of capability along a common path (see Figure 6).

Figure 6: Range of capability across the sector

There will always be individual organisations leading their peers and we want to identify, highlight and encourage such leadership. Successful endeavours that make innovative use of information must act as a beacon to the rest of the sector so that others can learn and implement solutions faster for the benefit of consumers.

At the same time the sector must improve those areas where we currently have weaker linkages. Isolated excellence in information systems will not create the overall sector gains required. To better co-ordinate care across the continuum we must connect and enable secure communication across all care providers, particularly long-term/ residential care and community providers.

Principal interventions

Action zones balance priorities for evolution by focusing on three principal interventions.

- **Increase participation** – we need to increase the overall participation rate in the sector for information sharing. This means increasing the degree of computerisation, but also means making sure that connections and networks are in place, so that appropriate information can be safely shared. Specific action zone initiatives will accelerate progress amongst the weaker links in our evolution towards a connected sector.

- **Enable collaboration** – we need to make it easier for different parts of the sector to collaborate in providing care to consumers. This means ensuring the key information anchors are in place that enable collaboration, as well as ensuring that electronic information can be shared and accessed in a standardised fashion. Specific action zone initiatives will create basic access to electronic data in the less mature parts of the sector, as well as more sophisticated collaboration in the more mature parts of the sector.

- **Improve targeting** – we need to continuously get better at targeting scarce resources by making more informed decisions. This means using data for analysis, so that the outcome of our programs and investment decisions can be assessed, and so that we can prioritise effectively. Specific action zone initiatives will allow the more sophisticated parts of the sector to be more precise and incisive in their interventions, their service delivery and their targeting of populations.

Action zones are not an exhaustive list of everything that needs to happen in the sector, nor are they designed to preclude organisations in the sector from innovating – their purpose is to define overall priorities for the sector as a whole.

4.3   What will the difference be?

HIS-NZ sets specific benchmark targets that are achievable over the next 3 to 5 years. These targets focus on making gains in linkages between primary and secondary health care, as well as improving the overall level of information sharing and collaboration across the sector.

In 3 to 5 years' time, New Zealand should be able to see a number of improvements.

- Community providers will be connected to a secure health information network. This will allow them to participate in information sharing and in accessing relevant data as it becomes available to the different initiatives.

It will enable transferring care from one provider (eg, hospital) to another (eg, residential care) to be more seamless as information is more reliably relayed about medication, continued treatments and necessary rehabilitation.

- All parts of the sector will be able to access relevant key event summaries online.

  This allows for a consumer's care to be more integrated across the continuum of their illness or injury treatment and rehabilitation. Key event summaries help provide information about the activities of different providers through the continuum, and ensure better co-ordination and decision-making.

- Primary care and secondary care providers will interact electronically around key events, discharges and chronic care/disease management.

  This will enhance the sophistication with which hospitals and primary care can begin to manage care, particularly chronic care, collaboratively, and to understand the patterns of care provided by these services and how they interact with one another.

- There will be greater collaboration and sharing of information between hospitals, GPs, diagnostic service providers, pharmacies and other practitioners.

  This will mean faster decisions, reduced duplication and less inconvenience for consumers.

- Interactions between secondary care and primary care providers will be more uniform. Routine exchanges of information such as discharge summaries, referrals and admissions for services should be the norm.

  This will enhance the continuum of care, ensuring care providers are more informed about the ongoing needs of their patients or clients.

- At a national level, key information gaps in our existing collections will have been closed, particularly in regard to understanding:

  - community, primary care and outpatient services; access to these data sets will be nationally enabled, supporting safe and high-quality care to consumers

  - the implications of our health strategies from a policy, funding and research perspective; we need to be able to monitor progress and evaluate the outcomes of changes to our service configuration.

The identified benchmark targets are a *minimum* for each part of the sector and are not intended to limit any particular organisation that chooses to evolve further, or faster. Some organisations in each part of the sector will exceed these targets and provide leadership for their peers as they evolve at a faster pace.

Figure 7 illustrates the benchmark targets for each part of the sector.

Figure 7: Benchmark targets for HIS-NZ (3 to 5 year horizon)
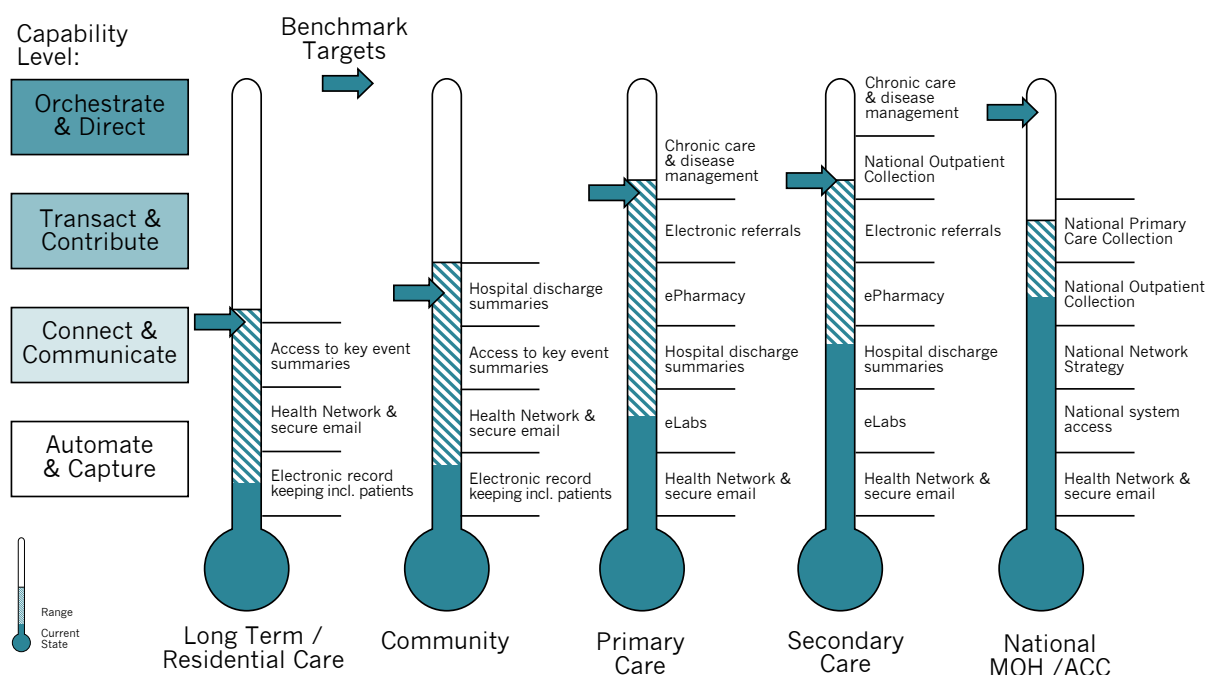
Implementation of HIS-NZ will lead to an improved health and disability sector.

- **Consumers** will receive care that is targeted to their health needs and provided in a co-ordinated way. They will also be more engaged, by electronically interacting with providers, where it makes sense to do so.

- **Care providers** will make more informed decisions at the point of care because relevant patient information will be more accessible and they will have immediate access to evidence-based knowledge on which to base their interventions. They will be able to collaborate with other professionals through shared systems and data around chronic conditions and disease management programmes.

- **Provider organisations** will be able to configure services to achieve the best outcomes for their population because they will be better informed about the needs of their populations.

- **Funders** will have information about the health status of their population, what services should be provided, and how effectively services are delivering desired outcomes. They will be able to target services more selectively, as well as being able to analyse population health and disability data.

- **Policy makers** and **researchers** will be able to identify which interventions will have the biggest impact on improving the health and participation outcomes of all New Zealanders.

Most importantly, we will be able to assess whether our major health and disability care strategies are paying dividends through reduced secondary care interventions and improvements in overall population health.

## 4.4 What are our initial priorities?

During the HIS-NZ consultation process many potential action zones were identified. Ones that clearly aligned with New Zealand health strategies were used to guide the development of priorities. These were further refined based on the principal interventions (increase participation, enable collaboration and improving targeting), and the technical development model (automate and capture, connect and communicate, transact and contribute, and orchestrate and direct).

There were six initial priorities selected.

- **Enable secure connections and access to health information** – This is a fundamental enabler to sharing data. All participants in a modern health system should at least achieve the second stage in the development model and should be able to be connected and to communicate securely.

- **Ensure national systems anchors are in place** – These are core systems that provide shared data and consistent business processes to the health and disability sector of New Zealand. They provide our reference points for nationally significant information and events. Examples of national systems include the NHI, the forthcoming Health Practitioner Index (HPI), and national collections that support policy analysis and targeting of needs.

- **Create and publish accessible key event summaries** – These are high-level electronic health record components that can be shared and accessed to support safe delivery of care and encourage greater co-ordination and integration of health services. Key event summaries are the starting point for co-ordinating care, improving quality, and enhancing a consumer's own health experience. This needs an effective way of linking information from different sources, an 'anchoring framework' (see page 87), to be in place.

- **Broaden the dialogue between primary and secondary care** – This includes expanding the level of electronic communication and co-ordination across primary and secondary care, particularly in the areas of referrals, discharges, chronic care and relevant clinical reported results. This will require national anchors to be in place so the right information is at the right place at the right time. Similarly, key event summaries will need to be initiated to enable broader dialogue.

- **Extend the collection of health information** – There are some areas where our health system has significant knowledge gaps, such as in outpatients, primary care, referred services and disability. As more health services are delivered in the community and outpatient setting, it is important that we close these gaps over time so that policy and prioritisation of health system resources can be better targeted. Information to support clinical decision-making should be as close as possible to the point of care and decision-making.

- **Safe access to national information taonga (treasures)** – Improving access to current national taonga within the context of the Health Information Privacy Code is essential for the support of population health and PHO-based activities. It is important that this information be available to decision makers: clinicians providing care and managers of health care organisations. It is also important for consumers to have access to information that will help them make their health care choices.

Figure 8 illustrates the linkages between the principal interventions, initial priorities and action zones. The principal interventions provide a link to major health and disability sector strategies, the priorities reflect system imperatives as they relate to information and action zones provide a focus for implementation planning in the sector.

Figure 8: From strategy to action: HIS-NZ action zones
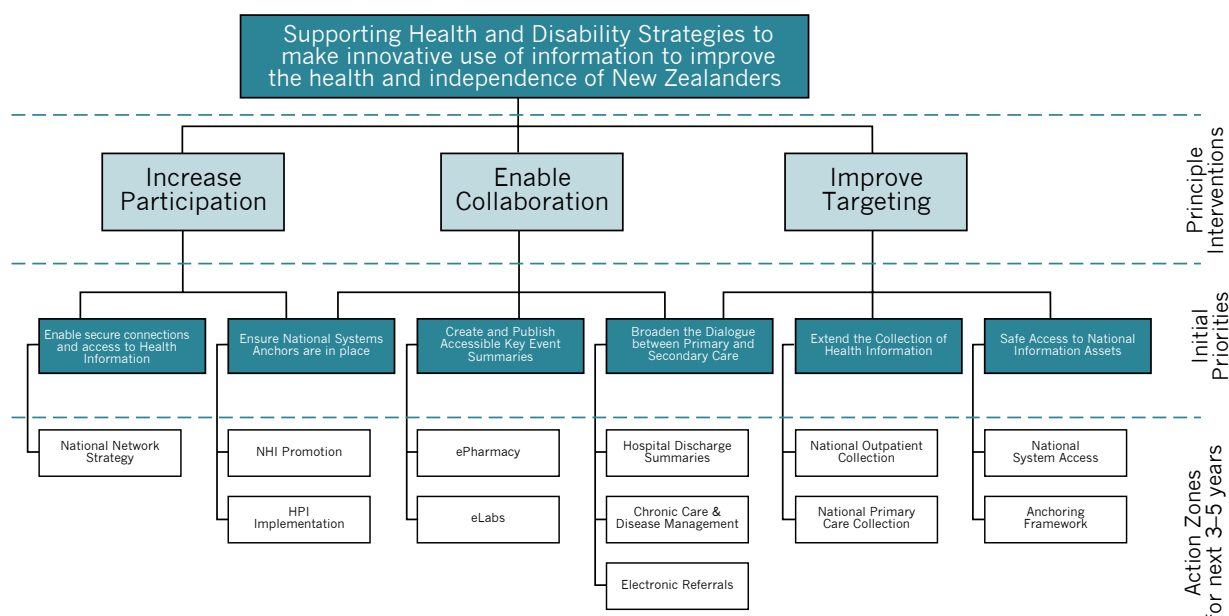
4.5   Action zones

A total of 12 action zones have been identified to provide the basis for a sector implementation plan. Different parts of the sector have different levels of development and will therefore have different starting points in implementing the strategy. The action zones provide choice as to starting points, but ensure end points are universal. They are described in the following sections.

National network strategy

The national network strategy action zone aims to design and implement a national approach to connectivity in the sector (secure broadband) in order to improve the quality and speed of communication in the sector. The strategy will need to recognise that the premium costs associated with the levels of security required in a secure health network are above commonly available basic Internet and telephone services. It will also address the need to increase the reach of existing networks.

There are significant parts of the health and disability sector that are not connected; reliable and fast access to the Internet, to secure email and to secure health information resources is neither as readily available nor as affordable as it could be. Further infrastructure investments are required to ensure access to the 'doorstep' in a number of rural and remote communities. Similarly, the sector needs to co-ordinate and leverage whole-of-government initiatives that seek to enable electronic service delivery in New Zealand.

As the evolutionary model of technical capability illustrates, to even begin to participate in collaborative information sharing requires the ability to connect to a secure health network. Connectivity is required if we are to realise benefits such as more co-ordinated care, greater knowledge sharing and collaboration amongst clinicians or enabling policy and funding decisions to be made on the basis of more robust evidence. Barriers to cost-effective connectivity need to be addressed.

The Ministry of Health, ACC and the DHBs all have roles in the development of a business case, and championing district and regional communication networks. Primary health care providers and the community have roles in supporting the uptake and adoption of improved networking capability.

NHI promotion

The NHI promotion action zone aims to raise awareness of the NHI, improve its accessibility as a unique identifier, and improve the collective sector NHI processes so it is more accurate and duplicates are reduced.

As the sector needs to rely more on the NHI and the associated national clinical data collections, it is important that programmes to improve NHI data continue. The NHI can be more effective as a unique identifier for tracking service delivery across a continuum of care, but requires additional work to resolve duplicates and improve access by key parts of the sector who either do not have access to the NHI or are currently not able to register and update clients on the NHI. As the NHI was not originally designed to be used as an identifier for population-based health boundaries (eg, for enrolment of patients in PHOs or for particular disease groups or risk groups), some remedial work needs to be carried out.

The NHI promotion action zone seeks to expand the use of the NHI, increasing its usefulness as a unique identifier used for supporting collaboration and information sharing, as well as for analysis purposes. It will explain the need for the NHI to be used in a broader mix of care settings to facilitate collaborative care programmes and more effective communication between clinicians of different specialties about the care for individual patients.

The existing NHI system will at the same time continue to improve its data integrity. The Ministry of Health will continue to work collaboratively with DHBs and other providers to ensure that sound business processes associated with the NHI are in place.

The NHI is a fundamental anchor for secure and safe communication of health information related to individual New Zealanders. The potential to confuse patients and their information is drastically reduced. The ability to deliver clinical alerts and warnings and for clinicians to become aware of information that will avoid potentially life-threatening situations requires a robust NHI.

The Ministry of Health, ACC and the DHBs all have roles in developing business cases for expanding use of the NHI, providing ongoing stewardship of the NHI and in managing its wider implementation. Alongside these activities, primary care providers and the community need to continue to expand the use of the NHI and champion local promotion and education about its value and use. The Ministry of Health will also need to undertake any policy necessary to support changes.

Health provider index (HPI) implementation

Implementation of the HPI will continue. Identified in the WAVE project, the HPI aims to implement a unique identifier that can be used for consistent referencing of practitioners, agencies and facilities in the health and disability sector. Over time, the HPI will support better clinical communication and collaboration in a secure and trusted manner.

At the moment New Zealand does not have a consistent way of finding and securely identifying practitioners in the health and disability sector. We need to have a directory of providers and organisations involved in the delivery of services that is up to date and can provide relevant contact details. This will improve the safety and integrity of care in the sector, so that electronic transactions and messages can unambiguously identify the most appropriate provider. It will also provide the ability to restrict or control access to health information or national systems, based on a provider's unique identity and role.

Like the NHI, the HPI is a fundamental anchor that will ensure that clinicians and others using the secure health network can easily identify and communicate with other users of the network.

The Ministry of Health, ACC and the DHBs all have roles in providing ongoing stewardship, designing how the HPI should be used and managing its implementation. Primary care providers and community providers have roles in assisting implementation and will use key parts of the HPI knowledge base, for instance they will better understand the variety of facilities where services are provided.

ePharmacy

The potential to improve clinical decision making and patient care through ePharmacy is significant. ePharmacy includes electronic transactions between prescribers and pharmacies, improved coding, tracking the dispensing of prescribed pharmaceuticals, enabling decision support tools, and providing a better basis for monitoring compliance.

New Zealand has a very computer-literate pharmacy sector, with 98 percent of pharmacies using computers as part of their business. These systems, however, cannot communicate with prescribing clinicians or readily report on the pharmaceutical part of a patient's electronic health record.

Even though the prescription of medication is one of the most frequent activities undertaken in the health and disability sector, large parts of the process could be, but are not, automated. As medication data is not currently communicated, stored and shared electronically, it is difficult for clinicians to get a complete picture of pharmaceutical history and activity at the point of care.

Risks that care could be compromised through interactions between drugs or through a lack of knowledge about all of the medications that are in place are higher than they need to be; apart from potential adverse outcomes, the lack of automation also creates administrative burdens. Data is frequently re-keyed (potentially creating data integrity issues) and formulary information on subsidies and adverse drug reactions is not always up to date when obtained through manual systems.

The ePharmacy Action Zone aims to create the ability for these systems to more readily share information with prescribing clinicians so that they can monitor and track the dispensing of medications they prescribe. Once this is in place, it seeks to extend this functionality to ultimately support electronic prescribing.

The challenge is to automate existing processes and create a platform on which 'smarter' transactions can provide clinicians with decision support, ensuring better clinical outcomes while realising efficiency gains.

The Ministry of Health, ACC and the DHBs all have roles in leading the resolution of legislative roadblocks, providing stewardship, developing a business case for implementation and working with primary care providers (including pharmacy stakeholders), who will be key participants in work on standards, business processes, education and implementation.

eLabs

Like ePharmacy, eLabs can improve clinical decision-making and patient safety, and substantially reduce waste caused by duplication. eLabs create an ability to monitor and track diagnostic tests from the point of ordering to the reviewing of results, regardless of whether a test is performed in the community or in a hospital. The initial focus should be on the reporting of results, but functionality can be extended to support the ordering of tests.

The ordering of laboratory and diagnostic tests is a core activity in the delivery of health and disability services, but nonetheless is frequently not automated. Although laboratory test results are increasingly available electronically, they are not always communicated beyond the provider who placed the order. Often the data is not electronically shared between providers (eg, there is no mechanism for one GP to send a patient's file electronically to another GP). Without a complete picture at the point of care, there is a risk that care may be compromised through incomplete diagnostic information and that duplicate tests are ordered instead, increasing costs of delivering care. As with ePharmacy, the challenge is to automate existing processes to create a platform on which 'smarter' transactions can provide clinicians with decision support, ensuring better clinical outcomes while realising efficiency gains.

The Ministry of Health, ACC and the DHBs all have roles in providing stewardship, developing a business case for implementation and working with primary care providers (including community laboratories), who will be key participants in work on standards, business processes, education and implementation.

Hospital discharge summaries

Critical to seamless care between a patient's discharge from hospital and care provided in the community is the effective and timely transfer of knowledge from the hospital to relevant primary health care providers in the community.

Although the majority of DHBs have implemented some form of electronic discharge summary in New Zealand, most are based on a point-to-point approach and do not create a consistent record that could be subsequently accessed by relevant care providers. There is a need for a greater national consistency that allows providers, when appropriate, to access and receive discharge summaries irrespective of where a patient was discharged from. There is also a need to extend discharge information beyond just inpatient discharges, to include emergency department, outpatient, mental health and

community events. If information from secondary care events becomes more readily available, the delivery of primary care can be better informed and co-ordinated, leading to better health outcomes for consumers.

At the same time, hospitals should look to expand the network of care providers to whom summaries are sent, eg, to a residential care provider. Timely dispatch of summaries should be extended to include summaries of outpatient visits and ultimately community services.

The Ministry of Health, ACC and the DHBs all have roles in facilitating common standards, developing business cases, and working with community and primary care providers, who will be key participants in work on standards, business processes, education and implementation.

Chronic care and disease management

This action zone focuses on increasing the capability for information systems to provide decision support care for the management of chronic conditions, with an initial focus on diabetes and cardiovascular disease. The purpose is to:

- assist the co-ordination of care between multiple disciplines and providers, for the duration of an illness/disability

- facilitate improved communication between a consumer and their care team, including care planning

- assist clinical decision-making, underpinned by evidence-based guidelines and system indicators

- facilitate programme continuity and consumer self-care support.

Traditionally, our systems have not been designed to be effective in identifying particular members of the population who might be at risk. We need to implement specific disease/disability management programmes and protocols for populations with high-priority conditions such as cardiovascular disease and diabetes.

We need to be able to intervene in a timely fashion, for instance, when immunisation programmes might have a significant impact on general wellness. Even when a target population has been identified it is not always easy to share data around care providers and to co-ordinate the delivery of services. Given the frequency with which New Zealanders move around the country, we need to be able to track immunisation data and required follow-ups on a consistent national basis.

In addition to being critical to New Zealand's long-term ability to manage these diseases, the systems will also help to reduce duplication and waste and improve the ability to target funding to areas suggested by best-practice evidence.

For this action zone, the Ministry of Health, ACC and the DHBs have a role in facilitating common standards, developing business cases, and working with community and primary care providers (who are in the frontline in leading prevention and treatment of these diseases) in the design and implementation of solutions.

Electronic referrals

Electronic referrals provide practical assistance to clinicians who wish to communicate with other care providers regarding the care and treatment of their patients. This may be seeking a second opinion, requesting the assessment of a patient by a care provider of another discipline, or advising the patient's usual care provider of a just-completed visit.

Currently there is a variety of processes and a lack of consistent protocols with regard to when and how we refer clients from one provider to another for specialist services, for an assessment or for further diagnostic work. Choosing the right care pathway can have a large effect on overall health outcomes, can reduce the administrative burden on the sector and can considerably increase consumer satisfaction and convenience. However, this requires consistent clinical guidelines that describe the 'right path' to be readily available at the point of care. It requires some automation, to support the transfer of care from one provider to another, so that collaboration can more easily occur. Systems in New Zealand currently have little workflow and routing functionality for referrals and there is no consistent way of accessing best-practice advice and information at the point of care, so that referrals are used effectively.

Like discharge summaries, electronic referrals rely on consistent use of data standards, effective education and privacy management processes, and the mutual engagement of providers who wish to send or receive the discharge summaries or referrals.

The electronic referrals action zone includes the need to develop a standard minimum data set for referrals between providers, focusing initially on implementing secondary care referrals from primary care and referrals to community service providers.

The Ministry of Health, ACC and the DHBs have a role in facilitating common standards, developing business cases, and working with community and primary care providers who will be key participants in work on standards, business processes, education and implementation.

National collection of outpatient data

Health care in New Zealand is increasingly taking place in outpatient or community settings, with many more patient interactions occurring in those settings than in traditional inpatient settings. While much is known regarding inpatient care throughout the country, very little is known about outpatient activity.

This creates difficulties in understanding how the implementation of primary care initiatives affects the delivery of secondary care outpatient services and in tracking the flow of consumers between DHB districts. The overall productivity and effectiveness of service delivery cannot be judged by tracking inpatient measures alone – many more services are provided in outpatient settings and the community relative to inpatient services.

The visibility of outpatient services will allow us to evaluate service strategies more effectively by looking at the patterns of care. Clinical data on disease progression combined with outpatient use data will support the development of better guidelines and referral protocols to improve the health and disability outcomes for clients. Linking outpatient data to inpatient data is a key first step in broadening our perspective from a traditional event-based perspective to the continuum of care spanning an entire illness episode – which for patients with chronic disease may mean the rest of their lifetime.

The national collection of outpatient data will significantly enhance the information available for planning, provide greater evidence of changes to health outcomes and enable funding to be better targeted to programmes in areas of high need.

The Ministry of Health, ACC and the DHBs have a role in providing stewardship, developing a business case for implementation and working with hospitals on implementation. Primary care providers can identify what reporting would be clinically relevant to their role in maintaining the health and wellbeing of their population and managing care provided in their chronic care and disease programmes.

National collection of primary care data

Over 50,000 consumers visit general practice services every day in New Zealand, whereas approximately 1700 are admitted to hospital. Across all primary care providers, little is known about these interactions such as the incidence, severity and patterns of treatment for particular conditions or diseases.

The major focus on enhancing primary care services in New Zealand, championed by the Primary Health Care Strategy, means that we need much more information at a national level as to the effectiveness and utilisation of primary care services than we have had up until now. From an administrative perspective, there are no standardised performance measures and only aggregate data is available to show how effective the service delivery models are. There is a need for more clinical and utilisation data on primary care, to assess what can be done to reduce the burden of major diseases as well as preventable admissions to secondary care. This will also allow the co-ordination between secondary and primary care to be assessed routinely, so that potential bottlenecks can be addressed. Adding primary care data to outpatient data allows researchers and clinicians to broaden their 'episode of care' analysis. This means that the outcomes of injuries and the management of chronic conditions can be much more effectively improved.

The Ministry of Health, ACC and the DHBs all have roles in providing stewardship, developing a business case for implementation, leading the necessary design, coding and standards work, and working alongside primary care on the design and implementation.

National system access

The national system access action zone aims to improve access to existing national systems so that processes work more smoothly and analytical insights are more readily available to the sector. Improved online access to national collections, with more useful and timely analysis and reporting, is also important if we are to make greater use of evidence in planning care, measure the achievement of outcomes, and target resources to greatest benefit.

A significant amount of data is collected nationally in New Zealand about the activity and effectiveness of health services and the wellbeing of New Zealanders. However, there is not always enough useful information available to feed back to decision-making in the sector by care providers, funders and policy-makers. Many stakeholders in the sector have, as yet, limited or no ability to access national systems – for example the PHO registration field on the NHI can only be seen by DHBs. Access to resources such as the Pharmhouse, National Booking Reporting System or Breast Screening data is also restricted. There has been limited ability to analyse data with the NHI attached, so that providers cannot derive actionable insights to improve services.

A lack of consistent policy, misunderstanding of privacy rules and lack of clear protocols around access have hampered efforts to enhance access to national systems in a timely manner. Improvements in technical infrastructure that provide more sophisticated ability to regulate access to national systems by role, by level of authorisation and by dataset in a consistent and granular manner are also required.

The Ministry of Health has a key role in leading the development of an initial business case, resolving privacy, authentication and security issues and developing improved navigation and deploying improved toolsets. The Ministry will need to work effectively with ACC and DHBs, as well as with other groups such as primary care on the design of different types of access and their specific reporting needs.

Anchoring framework

The anchoring framework action zone aims to 'retrofit' the NHI and HPI on to national collections and key data sets, so that our ability to link information is improved. It seeks to ensure that appropriate reference coding systems to support primary care, ePharmacy, eLabs, electronic referrals and the outpatient collection are available in a timely fashion in a sufficiently robust form.

Underpinning a population-based health approach is the ability to identify, analyse and compare like-with-like, for example, the relative effectiveness of different treatment patterns for cardiovascular disease, or different approaches to immunisation or screening programmes.

Individual implementations of electronic systems frequently follow their own specific standards and there is no common language through which information can be shared electronically. This leads to an inability to compare data (often collected in National Systems) and difficulty in linking isolated data sets for analysis and comparison. Consequently, it is virtually impossible to establish an 'episode of care' or a 'population' perspective. A more holistic perspective is vital if we want to understand how to improve the effectiveness and quality of our care delivery or achieve better outcomes for diseases such as diabetes.

The Ministry of Health has a key role in leading the development of an initial business case, resolving any related privacy or legislative issues, ensuring the necessary systems changes, and engaging effectively through governance and stewardship arrangements with key stakeholders such as ACC, DHBs and HISO as well as primary care providers.

New projects may emerge over time to support or enhance our existing list of action zones. The investment framework will consider such projects as they align to the priorities and our principal interventions. While we may consider other initiatives over time, we must be clear about our purpose and our priorities when we consider additional investments.

5 Guides for Building Our Information Systems Capability

5.1 Introduction

The success of the strategy will depend on how closely leaders and decision-makers in the health and disability sector adhere to the guidelines. Achieving collaborative outcomes for consumers often means that benefits are distributed differently amongst a number of organisations. At times this will require compromise and the sharing of decision-making with other organisations.

This chapter supports the implementation of HIS-NZ across the health and disability sector. Chapter 4 identified the action zones and the areas where we will place our priorities. This chapter discusses guides for building capability in information systems in the sector. These 'building guides' outline the key components required to deliver integrated information systems to the sector. They also articulate some of the design principles that we expect to adopt, so that workable solutions can be developed. They are:

- structural elements (national connectivity, applications, national data collections)
- foundations (standards, privacy and security)
- governance framework (capital investment framework, accountability frameworks, collaboration frameworks).

5.2 Overview of the building guides

Based on the themes that emerge from our collective health strategies, a number of structural elements need to be assembled for making innovative use of information to improve the health and independence of New Zealanders.

- National connectivity (networks and connections) that supports the movement of information between different parties in the health care system.
- Applications that allow us to:
  - automate transactions, supporting care and producing useful information as a by-product of delivering that care
  - create a better experience for health care consumers
  - reduce administrative workloads

  and that allow care providers to spend more time with patients.

- National data collections so that information can be analysed and shared to better target services that improve outcomes for health care consumers. This would include the key identifiers and reference data that we use for capturing transactions.

However, these structural elements cannot work in isolation and need to be built upon the following foundations:

- standards for supporting the exchange of information between providers, government and consumers where we need to be able to consolidate and share data

across different applications, and to interact in a common language across different parts of the health sector

- relevant privacy and security infrastructure and safeguards, to ensure that the system is trusted, while at the same time empowering action to improve health outcomes.

Interoperability requires standards for security and privacy. The flow of information must take place in an appropriate manner that safeguards privacy and confidentiality.

Governance is required to lead the construction and management of the structural elements and foundations, providing the 'how' relative to the 'what' of the structural elements and foundations. The following frameworks support it:

- capital investment framework – the structure to assist and guide public sector investment decisions and to ensure transparency in the expenditure of public funds

- accountability frameworks – outlines the roles and responsibilities of key organisations in the sector and the legislative and other frameworks that they operate within

- collaboration frameworks – structures within which all providers work together to reduce information system costs.

The following sections discuss each building guide in turn, and how it supports the future for information systems in the New Zealand health and disability sector. Many of the collaborative decision making structures are already in place, and a number of the guides have been recently developed.

6 Guide A: National Connectivity

6.1 Communication needs connection

As the delivery of care becomes increasingly more integrated, the movement of information is critical to maintaining and increasing standards of care. The co-ordination of many providers in the care of an individual requires each provider to know what the other is doing. This can be facilitated in a number of ways across local, regional or national settings. Irrespective of the approach taken, when treatment requires the co-operation of a number of physically separate providers, a network is required.

The health sector will be a major consumer of secure broadband and will rapidly increase its demand. The sector has variable experience with broadband ranging from 128 kbps internet connections to dedicated 34 mbps dedicated ATM links. It has a number of networks: some of these are sophisticated networks supporting electronic transfer of information while others, such as the physical mailing of lab results to clinicians, are examples of 'low tech' networks.

The benefits of broadband networks are clearly understood. They offer economic benefits – replacing paper-based referrals with electronic messages would no doubt have a financial benefit, and there are non-financial benefits in the timeliness with which information is received and resulting actions taken. A coherent strategy is required to maximise the benefits of broadband to the sector.

The Government has acknowledged the importance of a broadband network to the future of New Zealand and has recognised the gaps in current broadband infrastructure. It has responded to this gap by announcing funding for the provincial broadband extension (PROBE) project as a multi-agency initiative led jointly by the Ministry of Education and the Ministry of Economic Development.

Preliminary analysis by the Ministry for Health has shown that there is a significant correlation between the locations of schools and health centres (GP, hospitals and pharmacies). However, the health sector requirements for broadband are more comprehensive than the generic requirements of other sectors such as education. This is mainly due to the need for reliability of service, interoperability, and security, and to diverse application requirements. For example, health delivery requires constant availability rather than only during school hours.

The opportunities for the health sector through leveraging high-speed networks have also been acknowledged within the New Zealand Government Digital Strategy. Acting on these opportunities cannot, however, be taken for granted. The sector needs to be positioned to make effective use of high-speed networks in improving the delivery of care.

6.2 Progress to date

The sector has for a number of years supported the development of health networking that can support the requirements (speed, capacity, security, privacy, reliability) for ehealth. This has resulted in the growth of two commercial facilities for secure broadband ehealth networking, operating under the Health Network Code of Practice as the 'health intranet'. A significant number of ehealth transactions are conducted over these networks.

However, current issues with the Health Intranet include affordability, advancing technology and the availability of applications that make use of secure connectivity.

It is acknowledged that secure broadband presents a significant opportunity to extend the reach of traditional health care capabilities and support the delivery of more equitable health care in remote communities. In addition, it provides the underlying infrastructure for future health care delivery models, which may be organised around patients rather than provider settings.

Implications for rural health

Secure broadband has the potential to contribute to two aspects of the Rural Health Services. Broadband-enabled tele-health can link specialist services as a virtual team. It can also provide the rural patient with enhanced services remotely, thus removing the barriers of long distances and obstructive geographical features that affect ease of access for delivery of health services.

Implications for mental health

Tele-psychiatry has been one of the most popular areas of tele-health both for adults and children. For instance, Mental Health clinical applications accounted for 32 percent of all Australasian tele-health activity as at March 2000.

Implications for shared systems initiatives in the health sector

Outside of tele-health, secure broadband also enables regional and national collaboration initiatives to share information in support of the management and delivery of care, at point of care, irrespective of the location of providers or client.

What is required to take advantage of secure broadband?

A prerequisite to taking advantage of secure broadband within the sector is for the sector to have equipment capable of connecting to an electronic network. While the penetration of computers is high amongst the sector, connectivity cannot be taken for granted. For many community providers there is a lack of even basic computing capability, and computers are often used only for administrative activities.

Affordable access is a key criterion for many within the sector and is a current barrier to taking advantage of secure broadband. Given tactical investment decisions, the cost of going online is often seen as prohibitive to many providers within the sector. Often benefits are derived at an agency level but the provider incurs the costs.

How do we sustain secure connectivity?

A recent UK study[4] identified that inadequate setting of ICT standards resulted in a diverse range of incompatible systems across the health service and that resources were wasted on 're-inventing the wheel' at a local level. A study in Australia[5] gave similar results.

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[4] Wanless D. 2002. *Securing Our Future Health – Taking a long-term view*. Final report. London: HM Treasury.

[5] NOIE Access Branch, July 2002.

Standardisation of infrastructure and applications to ensure interoperability and access are critical for sustainable connectivity. The New Zealand Health Network Code of Practice has moved the sector well forward in addressing these issues. Ongoing sector leadership and commitment is required, and the Code of Practice will need to be reviewed to ensure that we continue to move forward.

Is there a compelling reason to use secure broadband?

Providers are likely to go online when the value to them of being online is real and attainable. Providing electronic information in the form of discharge summaries and lab results has already proven to be attractive to providers. Secure online access to a much richer range of information and resources such as hospital records and real-time approvals for special-authority prescriptions will increasingly provide even greater value.

There are numerous data exchange requirements from transporting structured data such as discharge summaries and referrals to online access to radiology images and tele-health. The current Health Intranet bandwidth for example is sufficient for the majority of users, however the capacity of the network is tested when organisations attempt to transfer very large files reporting activity across the network. Secure broadband will be required across the sector to enable online, real-time sharing of information.

One primary care organisation in New Zealand created a compelling reason for its members to adopt secure broadband through offering online clinical resources. The online resource was expensive for a small community, however when offered the service GPs were able to see the value and subscribed to the service. Another subsidised connections for a fixed period to stimulate interest, and when the initial subsidy lapsed only two GPs discontinued the service.

Further effort and investment is required within the sector to increase the value of subscribing to secure broadband. This may be driven regionally or even nationally by providing additional services and incentives for practitioners to make use of networks to collaborate.

6.3 Specific strategies

High-speed networks (eg, always on, image capable, etc) are new technology, and most current applications and business processes were not designed or necessarily configured to make the most of the opportunities they present. Further investment is required by application vendors to make use of connectivity. This investment will be required to reposition the value of these applications to the sector and to support improved processes eg, care programmes requiring collaboration by multiple organisations.

Key strategies for improving national connectivity envisaged by HIS-NZ include:

- build on the existing national Health Network Code of Practice governance model; strong representation across the whole sector is essential for ongoing interoperability and standard setting

- economic framework – complete a cost and pricing model using estimated numbers/volumes/capacity ensuring secure broadband is affordable particularly for primary and community care providers

- policy framework (PAS, and governance) – complete the policy work on privacy, authentication and security and put in place a 'simple' and 'pragmatic' framework that can be used

- solution framework – continue to develop the architecture for health connectivity outlining directories and authentication mechanisms and consolidating voice, data and image to provide a more comprehensive offering to the health sector

- make connection to secure broadband as simple as possible for primary and community providers

- improve the general infrastructure amongst the neediest with regard to the availability of personal computers, secure broadband and appropriate training (eg, community and primary providers)

- expand local, regional and national applications to provide interfaces for information access and data transfer; this will 'lower the bar' for providers to gain access to information and participate in information exchanges

- work within the new Digital Strategy[6] to ensure that the commercially available secure broadband options are made available to all regions of New Zealand.

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[6] Minister of Health. 2005. *The Digital Strategy: Ceating our digital future*. Wellington: Ministry of Economic Development.

7   Guide B: Applications

HIS-NZ requires a number of applications to be implemented consistently across the sector over the next five years. For HIS-NZ to be successful, it will require significant development of information sharing capability across organisational boundaries. It will require a refocus of investment to ensure that capacity is developed regardless of organisational size.

The majority of current applications are aligned with care delivery processes within organisations and often do not make themselves available to outside enquiry or provide information outside the boundaries of the organisation delivering the care.

The shift from treatment-based and event-based care to population-based prevention and care has meant that health care systems now have a new set of requirements that place greater emphasis on sharing information across organisational boundaries.

HIS-NZ considers that applications fall into two categories: 'anchor' applications and 'action zone' applications. While it is recognised that each organisation may have a different starting point, it is important that each organisation completes the implementation of the applications within five years.

7.1   Anchor applications

Anchor applications are **single, national** systems that provide a standardised output to support business processes across the sector. They include:

- the National Health Index system – while it has been available for a number of years, it has been implemented comprehensively only within secondary care, and in more recent years by organised general practice for pharmacy and laboratory referrals and in enrolment; it will need to be more widely available across the entire sector to effectively support other applications such as EHRs, ePharmacy and eLabs

- the Health Practitioner Index system – while this is currently under development, it will need to be available across the entire sector to be fully effective in supporting distributed EHRs

- existing and planned national information collection systems such as the NMDS (inpatient discharges), and systems for outpatients, cancer, cervical screening, PHO enrolment, as well as the National Immunisation Register

- the Health and Disability Information Exchange (HADIE) – providing a single point of access and authorisation to national collections, applications and services such as HealthPAC.

7.2   Action zone applications

In addition to anchor applications, a number of action zone application strategies will be required to support the action zones. The focus of the action zone applications is to support decision-making during the care delivery process and by providing practitioners with relevant patient details. Furthermore, these applications will provide a greater degree of automation in support of common transactions.

Through integration with care delivery, they will provide a logical place through which information can be recorded and shared.

It is important that these applications have a national consistency and use national standards regardless of whether they operate locally, regionally, or nationally.

While there are many applications that need to be implemented within the health sector, HIS-NZ has prioritised applications that will be required across the sector in the short to medium term to support the key action zones, including:

* ePharmacy
* eLabs
* eDischarge summaries
* eReferrals
* eDisease Management.

7.3   Application scope – national, regional, local

Effective integration between national, regional and local settings is critical in delivering better care. Poor data collected in local applications and aggregated in national applications will lead to poor policy. Conversely, the inability to access or gain insight from national applications is likely to have an impact on care delivery in a local setting.

HIS-NZ defines applications in three settings.

* 'Core' applications can only function well if they are singular and are best managed nationally. They include a governance model that provides for sector stewardship, eg, provision of one National Health Index number. They support standardised business processes, shared data and national monitoring for the health and disability sector of New Zealand. An example of this would be the national information reporting and collections, as well as some national-level funding and payment systems.

* 'Common' applications, supporting clusters of organisations operating with standard business processes, are normally regional. This model can save costs through economies of scale, and is becoming increasingly prevalent in the sector. Applications that are already in place at a regional level include some laboratory repositories or shared payroll and financial applications. Common applications should be consistent with national directions.

* 'Diverse' applications are typically built for a specific purpose and often require local development of highly innovative applications. An example of would be the localised disease management applications such as those recently developed for the management of diabetes. Encouragement must be given for the more successful of these to be rolled out to other organisations and become common or even core applications.

Figure 9: Settings for New Zealand's health applications

Harvesting success

Investment has to be considered at all three levels, as over-investing in one area does not provide adequate functionality across the sector. Similarly, investment at the local end needs to be consistently 'harvested' and distributed regionally or nationally. This approach can be illustrated by the recent National Immunisation Register that was prototyped locally and then redeveloped to become a core application for the sector.

8 Guide C: National Data Collections

8.1 The importance of a national view

The national collections are where health and disability sector information is consolidated and aggregated over time to inform policy and provide the means to assess health outcomes and the effectiveness of funding and prioritisation decisions.

When they are established it is important that their purpose is clear:

- support policy, research and prioritisation by enabling the analysis of national trends and outcomes. Normally this does not require data at an individually identifiable level, although where this is required, personal information will be encrypted

- support the delivery of health care by providing reference sets, registers, and NMDS inpatient discharges where the information is identified by the NHI and access is available to consumers and their care providers. These collections can also support policy, research and prioritisation, as well as national co-ordination of, for example, cervical and immunisation screening.

The New Zealand health and disability sector is currently well serviced by the early development of a number of national collections. All of these collections need to be continually improved over time (eg, through appropriate and safe access and connectivity) to ensure they provide better value to the sector. Some of the current national collections appear in Table 2.

Table 2: Definition of National Collections (data sets)

| National collections (data sets)	Definition
National Health Index (NHI)	A database that assigns a unique identifier to health care users including demographic details.
Medical Warnings System (MWS)	A database designed to warn health care providers of the presence of any known risk factors that may be important in making clinical decisions about individual patient care.
National Minimum Dataset (NMDS)	A database of inpatient and day patient publicly funded hospital discharges.
Private Hospital Reporting System (PRS)	A database of inpatient and day patient privately funded hospital discharges.
Mortality Collection	A database of underlying cause of death information.
New Zealand Cancer Registry (NZCR)	A database containing the incidence of malignant tumours.
Workforce Collection	Thirteen stand-alone databases of annual survey information from each of New Zealand's registered health professions: doctors, nurses, dentists, chiropractors, medical laboratory technologists, medical radiation technologists, optometrists, dispensing opticians, psychologists, occupational therapists, dieticians, podiatrists, and physiotherapists.
Mental Health Information National Collection (MHINC)	A database of publicly funded health services providing mental health care. The database includes publicly funded hospitals, community mental health services, alcohol and drug services and residential and supported accommodation services.
National Booking Reporting System (NBRS)	A database with details on health events where a patient has received an assessment of priority for a medical or surgical service and is accepted for publicly funded treatment.
Maternity and Newborn Information Collection (MNIS)	A database to record service provision and outcomes of maternity services provided in New Zealand.
Pharmaceutical Information Database (Pharmhouse)	A database of claim and payment data by pharmacists for subsidised dispensing.
Laboratory Claims Data Warehouse	A database of claim and payment data from laboratories for subsidised laboratory services.
Hepatitis B Data Warehouse	A warehouse of primary and secondary care information for the Hepatitis B Screening Programme pilot.
Breast Screening Programme (BCST)	A repository for storing breast-screening information concerning programme participants and whether or not cancer is diagnosed and treated.

Other collections planned or implemented include the National Immunisation Register, the Health Provider Index and the PHO Enrolment Register.

8.2 Events versus populations

Irrespective of the settings for the collection of data, ie, national collections, regional repositories or local points of care, it is important that health events are identified consistently at the unit level with anchors such as the NHI and HPI able to integrate data to form a population view. This view could be either for use in care delivery (eg, a GP viewing patient history) or unidentified at an aggregated level for policy and research.

The figure below illustrates that to have a population-based view there first needs to be electronic data available from activity in each service setting, irrespective of where it is stored. The shaded areas in the columns approximate the degree to which electronic data is currently available nationally at unit level. Safeguards are required to ensure that the populations views deal appropriately with privacy and security issues. For instance when data is aggregated across collections, NHIs should be encrypted.

Figure 10: Events, anchors and population views
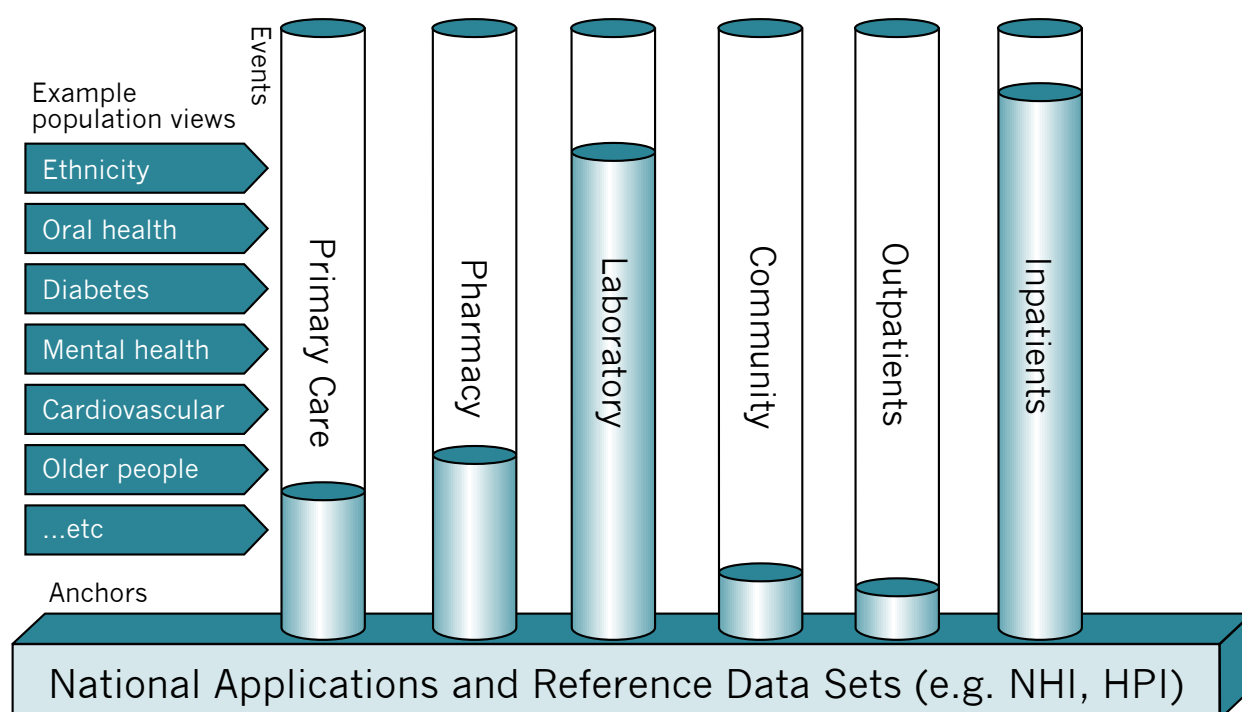
Secondly, the figure illustrates that to provide valuable information about populations and diseases, a number of 'anchors' such as the NHI and HPI are required to cross-reference and integrate data. This would allow core data to be navigated and a complete picture developed for a population when appropriate – this may be someone researching a particular disease, or a medical practitioner at the point of care.

8.3 An assessment of current national collections

Are national collections covering the right things?

As the delivery of health care shifts from treatment to prevention and inpatient admissions to outpatient visits, the current suite of national collections will need to be expanded to better align with these changes.

In national collections, there are currently inconsistencies in the range of settings where data is collected. For instance, there are over 50,000 visits to general practice services every day in New Zealand for which we have little information nationally for planning and research, whereas for the approximately 1700 admissions to hospital, we know a great deal from the NMDS.

While these inconsistencies can be explained in terms of earlier policies that have had more of a hospital focus, the movement of treatment to an outpatient and community setting will require additional national collections (eg, primary, community and disability support services).

Coding data within national collections

There are a number of issues related to the coding of data collected by National Collections. First, the consistency of the application of codes at the data source, eg, hospital coding of NMDS, and second, the code being not necessarily the most appropriate, for example, the use of Pharma Code in the Pharmhouse (which is a distribution code, not a prescribing code). This reduces the value of any data analysis that may need to be performed.

Any clinical coding model must consider the cost and effort associated with consistently coding events. We need to ensure that the right skills and incentives to accurately code are concentrated in the areas where the majority of events require coding (ie, primary care). The consistent use of appropriate clinical coding would improve the quality of collected data, as would the introduction of quality controls at the point of data collection.

8.4   Specific strategies

There are a number of specific strategies envisaged by HIS-NZ that will enhance decision-making within the sector, ranging from decisions on care by clinicians seeing consumers to policy makers assessing priorities for health improvement.

Creation of new national collections

- Outpatient
- Primary care
- Immunisation
- Diabetes and cardiovascular
- Cancer (clinical)
- Dental.

Better data quality and compliance

- NHI on every event (eg, pharmacy prescriptions – resolve legislation issues).

Appropriate coding

- NHI data quality (eg, ethnicity).
- Medicine terminology (pharmaceutical formulary) coding.
- Laboratory test coding.
- Outpatient coding.

9 Guide D: Standards

9.1 The role of standards in effective communication

The health and disability sector requires many participants working together to deliver care. The sector is highly dependent on information: information is used in both the delivery of care and the management of the sector. The relationship between the participants locally, regionally and nationally requires that information is shared for planning, funding and treatment purposes. Standards are critical to enable this information to be shared effectively and efficiently.

Standards are required for information (eg, data sets, coding), for infrastructure (eg, messaging, security policies), and business processes (eg, ePharmacy, governance). To progress the Primary Health Care Strategy, an increased focus on the primary care setting means an increased focus on standards. Data and business process standards will be critical in enabling the large numbers of primary and community care organisations and referred services organisations (pharmacies, laboratories and radiology providers) to improve patient care by sharing information electronically. DHB and ACC strategies also require standards to support the integration of care between primary and secondary providers.

An independent sector organisation, the Health Information Standards Organisation (HISO), is taking a key co-ordination role in the development and implementation of Information Management and Technology standards for the health sector. It works closely with standards development groups, end users and other key stakeholders to develop standards.

Its core functions include:

- standards oversight – to provide an integrated oversight of the relationship between health sector initiatives and relevant standards

- prioritisation – to develop a co-ordinated view of the relative importance of various health information standards

- quality assurance – to review the existing standards, plans and activities and to confirm appropriate sector-wide plans

- championing of emerging standards – to review existing sector developments where standards such as referrals and discharges are being developed and tested and to support these endeavours

- standards development – to facilitate standards required but not already being developed

- development of funding options – to recommend how specific standards developments should be funded

- endorsement – to agree on a suitable set of existing health information standards

- advocacy – to promote the adoption and use of endorsed standards

- monitoring – to review the progress of development and implementation of standards.

9.2   HISO standards framework

The HISO standards framework is a high-level structure that establishes a foundation through which standards are derived, developed, and disseminated within the sector. The standards framework:

- establishes the foundation for information standards and the conditions required to sustain an ongoing programme of advancement and improvement

- emphasises pragmatism and collaboration as two key principles to ensure sector ownership of decisions (including the critical area of clinical involvement)

- appraises standards with respect to government policy, operational requirements of the sector and current priorities

- allows for autonomy and provides the health sector choice with respect to the standards the sector adopts; it supports the adoption of international standards where feasible, and allows the creation of new standards to support local requirements where international standards are unavailable or unsatisfactory

- ensures linkages with Australian health sector standards so that, where appropriate, these can be leveraged to minimise costs and maximise benefits for the New Zealand health and disability sector.

9.3   An assessment of current standards

HISO is a new organisation with significant buy-in from all parts of the sector, which has resulted in a substantial work programme that is moving rapidly toward its objectives.

Within the sector the development of standards has been driven by a need to transfer and integrate data. This need may have been localised and restricted to an individual provider (eg, the use of Read coding at ACC) or driven by national needs (eg, standard messaging format and data structures for the National Minimum Dataset). HISO has prioritised further standards development to address the needs.

9.4   Specific strategies

The 2004/05 HISO priority focus for standards are:

- Ethnicity
- Health Provider Index
- LOINC Laboratory Codes
- Primary practice management systems
- HL7 messaging
- Referrals and discharges
- eLabs
- ePharmacy
- Primary care clinical performance indicators and referred services management
- Chronic disease management templates
- NHI and national collections
- Outpatients (non-admitted) national collections data set
- Secure broadband and email connectivity.

10 Guide E: Privacy and Security

10.1 Maintaining trust in, and the integrity of, communication

Privacy and security are cornerstone principles of the use and collection of personal health information and are supported by New Zealand privacy legislation.

Privacy and security of health information in the health and disability sector are important for the following reasons.

- Most health information is collected in a situation of confidence and trust, often in the context of a health professional/patient relationship; maintaining this confidence and trust is critical.

- Much health information is highly sensitive and may include details about an individual's body, lifestyle, emotions, behaviours and practices, which are particularly intimate, or which may, if improperly disclosed, be misused.

- Health information may be required by a health provider, or other providers treating an individual, long after it has ceased to be needed for the original episode of care and treatment.

Realising the gains envisaged by the Primary Health Care Strategy requires care providers to share information with other care providers and organisations, and they need to be able to collect and share this information in a trusted and secure environment.

10.2 The Privacy and Security Guide (PAS)

The New Zealand health sector has a number of existing guidelines including the Health Network Code of Practice, Health Information Privacy Code and the Health Intranet policy for the safe and secure electronic sharing of information.

To date there has not been a consolidated view of security and privacy policy that the sector can easily reference.

Given this context, the Ministry of Health and ACC are leading the development of a single consolidated guide for the sector. The Privacy, Authentication and Security (PAS) guide will bring all of the existing documents together and specify a consistent level of security and privacy for the sector.

The privacy and security protocols developed under PAS are based on the *SNZ HB 8169:2002 Health Network Code of Practice* and *Health Information Privacy Code 1994*. In addition, security policies produced by the Health Intranet Governance Body have also been used to develop a set of protocols.

The *Health Network Code of Practice* was developed by Standards New Zealand in association with the Ministry of Health. It was the founding document for security within the health and disability sector. PAS builds upon the principles for the *Health Network Code of Practice,* and once established in the sector, will become the new standard.

Figure 11: Privacy and Security Guide (PAS) framework
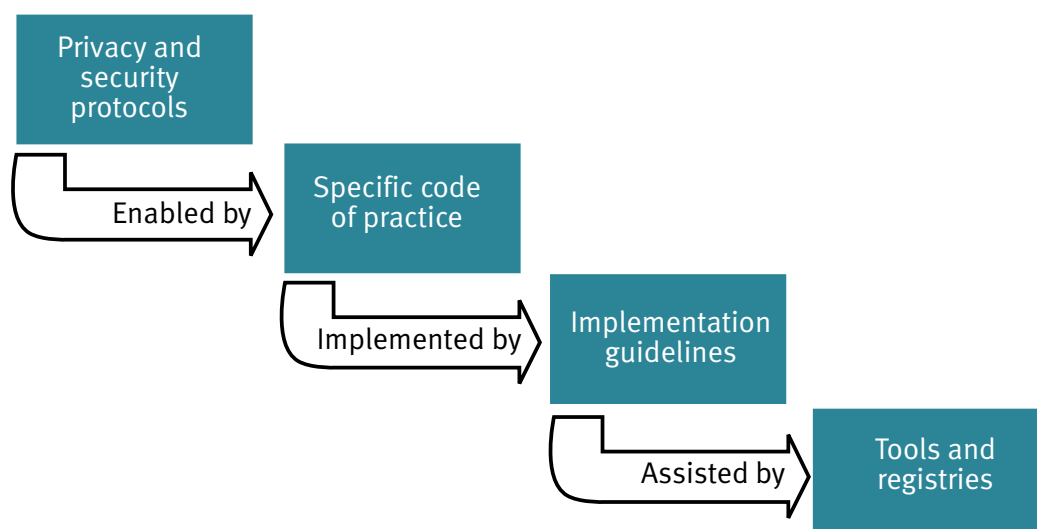
The PAS protocols provide information and clarity that is relevant specifically in the health and disability sector to enable the following:

- Provide individuals and organisations in the health and disability sector with a set of protocols to enable the implementation of reasonable and appropriate privacy and security measures that balance costs, risks and the need to protect electronic health information.

- Avoid conflicting privacy and security approaches in current and planned electronic health implementations and allow organisations to take full advantage of the potential benefits of electronic health solutions.

- Establish consistent and coherent privacy and security practices across the health and disability sector, including standardising the roles and responsibilities for privacy and security, processes and appropriate technology.

  Increase the level of privacy and security co-ordination and collaboration within the health and disability sector, including suppliers of technology and technology services, and other third-party suppliers who support the collection, use and exchange of electronic health information.

- Provide an authoritative reference point for organisations and individuals within the health and disability sector who intend to implement privacy and security measures to safeguard electronic health information.

- Provide guidance to management.

- Provide the foundation to create a culture of privacy and security awareness within the health and disability sector.

The PAS guide provides a number of key strategies; basing actions on these strategies will ensure that trust is developed and maintained. These strategies include:

- a specific Code of Practice for the sector

- a Code of Practice for each major participant involved in implementing or using information systems for the health sector; the participants identified include:
  - system user
  - system provider
  - network provider
  - system developer
  - system vendor

- practical implementation guidelines (including passwords, encryption, firewall, etc)
- a self-assessment checklist for the sector and the implementation of a national register of systems that contain confidential patient data
- an approach to monitoring privacy and security compliance.

10.3 An assessment of privacy and security within the sector

The level and understanding of privacy and security responsibilities in the sector need to be enhanced through education, improvement of business processes, and promotion. The basic principle is not that personal health information cannot be shared, but that the person needs to be advised before collection or sharing, and the reasons explained.

The WAVE report noted that the privacy legislation was widely misunderstood and often poorly applied. Initiatives such as PAS address information system controls and ensure that the sector is a trusted custodian of data, but without further education regarding privacy and associated legislation, health sector information will remain under-utilised.

The WAVE report also noted that a poor job had been done in educating the health consumer about information being collected and how the information is used. WAVE specifically recommended that a public awareness campaign be undertaken to educate health consumers about the purpose and use of health information.

There are still gaps that need to be addressed in educating both the sector and the public on issues of privacy. A balanced approach is required to ensure that the system is secure and that the public has enough trust to allow sensitive information to be shared between providers during the delivery of care.

There is often a lack of focus on the weakest link in the information chain. Once again, the WAVE report identified deficiencies in the process of managing paper-based information as a weakness in the management of privacy. For many in the sector the capture of data is a two-stage process – consultation often happens at the bedside with information being transferred to an information system after the event.

Addressing the challenges

A balance needs to be struck between educating both the sector and the public and putting effort into securing systems and networks.

Privacy and security policies need to consider 'pragmatic trade-offs' whereby the patient outcomes are considered within the context of privacy and security frameworks. Finding a workable balance will be key to effective collaboration in the sector and the delivery of integrated care.

10.4 Specific strategies

- Continue to address the issues identified in WAVE.

- Complete and implement the PAS guidelines.

11 Guide F: Governance of HIS-NZ

11.1 Ensuring implementation over the longer term

To ensure HIS-NZ is implemented over the longer term, it is essential that a good governance model be in place to oversee its implementation and review.

Governance is the set of processes that ensure that an asset or strategy is sustained for the benefit for a group of people who value it. Governance often comprises two major processes: that of stewardship, and that of custodianship.

Governance comprises:	
Stewardship, which is: • representation of stakeholder interests • oversight of the delivery of the strategy to meet these requirements	and Custodianship, which is: • day-to-day management • operational decision making on allocation of resources or funds • management of IS or business projects

It will be important for the longer term to ensure good stewardship is in place for HIS-NZ. Stewardship in this context is intended to:

• provide a capability to oversee and guide the implementation of HIS-NZ

• facilitate decisions on priorities, compromises on overlapping jurisdictional responsibilities, and resolution of issues.

Stewardship of HIS-NZ

In the context of HIS-NZ, stewardship is the responsibility for taking oversight of the strategy on behalf of others. This involves:

• promoting and developing the Strategy

• ensuring sustained implementation of the Strategy

• representing the interests of stakeholders in the management of that Strategy.

When multiple agencies, organisations or individuals share common needs and interests in a sector strategy, there needs to be input and representation from these groups in the oversight of the strategy. The stewardship arrangements provide processes and mechanisms for these groups to act collectively in the interest of the effective and sustainable management of the strategy.

Without appropriate and effective stewardship arrangements it is not clear how stakeholder input is gained, who is responsible and accountable for defining requirements and both duplication of activities and gaps in activities can occur where no one assumes responsibility for decisions. The result is poor definition and understanding of stakeholder needs and the development and use of resources is less than ideal.

Effective stewardship demonstrates the following features.

- Clarity of purpose – stewards have a clear understanding of what they are governing.

- Clarity of accountability vs responsibility – stewards understand where they fit within an overall accountability framework, who they are accountable to and why. Linkages with other processes and other groups associated with the 'thing' being stewarded are clear.

- Appropriate levels of expertise and mana – stewards have a level of expertise and knowledge, which allows them to discharge their responsibilities effectively. They have enough mana for others to accept their stewardship decisions.

- Clarity of function and process – any member of the public needs to be able to understand how stewards come to make the decisions that they do make. Any member of the public needs to know how to interact with, and influence that decision making process. Therefore, all processes that support the decisions that stewards make are clear, unambiguous, and transparent. These processes include consultation and communication processes.

Stewardship Objectives

Effective stewardship will provide:

- strategic oversight – providing an integrated, sector-wide strategic perspective of relationships between health information initiatives

- prioritisation – developing a co-ordinated view of the relative importance of various health information projects

- quality assurance – reviewing the existing plans and activities to confirm an appropriate sector-wide approach

- championing emergent strategies – reviewing and supporting existing sector developments where projects (like referrals and discharges) are being developed and tested

- standards – facilitating of standards by HISO required but not already under way

- developing funding options - recommending how specific projects could be funded/ resourced

- advocacy – promoting the strategy

- monitoring – reviewing the progress of strategy.

Accountability and Stewardship of HIS-NZ

As HIS-NZ supports the New Zealand Health Strategy and the New Zealand Disability Strategy, it is important that the governance model reflect this. It would need to be determined whether it would be most appropriate for the stewards of the strategy to report directly to the Minister of Health, or indirectly through the Ministry of Health. There will also be a requirement for ongoing support and funding and this will need to be factored into any governance arrangements. Resourcing models may vary due to the approach taken on stewardship objectives; however this would normally include a minimum base funding for operations, meetings and a secretariat and, or project support.

Representation

To be effective and representative stewards must represent the sector. However there are likely to be compromises required on the size of a stewardship group so that it can function effectively. It is suggested a stewardship group be set up, with a maximum of 10 to 12 members, including the Chair, and that members be appointed for no longer than 24 months.

The affected/interested parties include (but are not limited to):

• Ministry of Health

• DHBs

• ACC

• the Pharmaceutical Management Agency of New Zealand (PHARMAC)

• secondary care organisations

• primary care individuals and groups

• community care providers

• referred services (including pharmacies and laboratories)

• Māori and Pacific groups

• professional groups

• other health- and disability-related organisations.

Appointment Process

It is recommended that the Minister of Health approve the appointment of the members of a stewardship group based on nominations from the sector, where sector representative organisations forward the names of at least two nominees to the Minister for consideration. These nominees should be in a position to speak authoritatively for their nominating group. One representative will be appointed from each set of names. It is usual to also have the flexibility to nominate up to three additional members to reflect other sector interest groups.

Custodianship

To ensure implementation and execution of the strategy it will also require good custodianship. It is expected that this will be required at two levels:

• at a national level where national implementation programmes occur

• within organisations as each sector organisation re-orientates and implements their programme of work to support the strategy.

At a national level there will be a requirement for custodianship of the national programme and the location and management of this will need further consideration by the national Stewardship group once appointed. The custodianship responsibility within the participating organisations will be the organisations' responsibility however there may be some benefit in national oversight of this activity through updates or reports to the national Stewardship group.

12 Guide G: Collaboration Frameworks

12.1 The role of collaboration frameworks

Collaboration frameworks assist in decision-making and implementation once priorities have been established.

There are four stages to developing an effective capacity for collaboration within the sector. These have been developed in part across the sector, and their continued development will be critical to HIS-NZ success. There are a number of steps required in achieving this.

1. Ensure the confidence of the sector is evident and to a level that can provide productive engagement. This may require initiating a number of projects in good faith to build trust and test the best approach to collaboration. The initial WAVE activities and regional collaborative actives in DHBs have provided a useful opportunity to develop and fine tune sector engagement.

2. Ensure that co-ordinated action and change management can be achieved across the sector; this may mean establishing formal collaboration groups that have good stakeholder representation.

   The recent development of the Information Liaison Group, combining DHBs and the Ministry of Health information system groups, has provided a useful beginning to sector change management, providing co-ordination of activity across national systems in NZHIS and HealthPAC.

   Similarly, the CIO, CEO IT and CFO forums have proved useful in co-ordinating and implementing change. The linkage or extension of these to include the wider sector such as PHO, NGO would add further value and will be necessary to ensure successful implementation.

   Because of the size and complexity of the health and disability sector, there has been an increase in the formality of sector planning and investment, with the introduction of guidelines for information systems planning and investment in information technology.

3. Implement the relevant governance or stewardship models to support and guide ongoing decision-making around established sector infrastructure such as national collections. These will extend the stakeholder model to formal involvement in the oversight and stewardship of sector infrastructure. A draft stewardship model is under development, and once completed will provide a blueprint for implementing stewardship over national collections in NZHIS.

4. Put in place a clear and concise strategy that directs the programme of work across the sector indicating priorities and key areas requiring attention and action. HIS-NZ will outline the key action zones providing a focus for activity for the next 3 to 5 years.

12.2 Target areas for sector collaboration for HIS-NZ implementation

1. Government agencies working together for consumer benefit

The **e-government programme** provides guidance for government agencies in supporting and enabling interagency IS collaboration in three broad ways – co-ordinating whole-of-government IS initiatives, conceptual and IS standards frameworks, and interpersonal networks.

Table 3: Collaborative mechanisms and sector response

Collaborative mechanism	Health and disability sector response
IS initiatives • Portal (www.govt.nz) • Metalogue 2 (NZGLS compliant metadata authoring tool) • Autonomy (portal search engine) • S.E.E Mail (Secure interagency email) • XML Gateway (under development) • Other parts of 'component architecture' as they are developed (for details see www.e.govt.nz/news/2003032001.asp and http://www.e.govt.nz/docs/bfc-200302/) • RSS schema for syndicated news publication (see http://www.e.govt.nz/docs/rss-draft-200304/) • Electronic procurement • Shared workspace • Authentication	• Use as a means of providing access to information and services (see NZGLS below) • Reuse for internal IM purposes • Reuse for agency specific purposes • Implement • Use for information exchange • Use as appropriate. Contribute components where sensible • Use for publishing news items to www.govt.nz, and reuse for other internal purposes • Use the GoProcure system once in full operation • Use shared workspace tools for own purposes • Ensure that authentication processes are aligned with the Government's Authentication Policy Framework
Conceptual and IS initiatives • E-government Strategy • E-government Interoperability Framework (e-GIF) • New Zealand Government Locator Service metadata Standard (NZGLS) • Web Guidelines • Service delivery architecture (component of E-government Strategy) • S.E.E. PKI and Directory Policies	• Align with the strategy as appropriate • Adopt for areas of IS not covered by HISO • Create NZGLS metadata and supply to the Portal • Adopt • Use as a tool to assist in developing IS strategy supporting service delivery • Adopt as appropriate
Interpersonal networks • E-government Agency Leaders Network and CIO Network • E-government Unit	• Consider joining the networks • Liaise with the Unit over e-government

2. Co-ordinating change across sector systems

The Information Liaison Group (ILG) provides a forum on IS services provided by the Ministry of Health where changes to business rules and reporting requirements can be discussed and prioritised. The ILG has an impact on the decision-making processes of all DHBs and the Ministry of Health, in that it is a forum where these parties can be represented when changes to business rules and reporting requirements from Ministry of Health IS services can be discussed and prioritised.

A DHB's Operating Policy Framework (contained in their Crown Funding Agreement) requires DHBs to maintain the national agreement administration and payment systems and information support systems that are business units of the Ministry of Health: Health Processing, Administration and Contracts (HealthPAC) and the New Zealand Health Information Service (NZHIS).

Chaired by the Ministry of Health's Deputy Director-General, Corporate and Information, with representatives of DHB funding and planning managers, finance managers, and information managers, objectives for the ILG are to:

* prioritise changes to standard information requirements based on individual funder requests

* oversee the Memorandum of Understanding that describes the relationship between the Ministry business units and DHBs, including the services that are delivered to DHBs

* provide funder/end-user input into information management projects

* ensure adequate communication to the corporate management of the funders that are not directly represented on the ILG.

The Health Intranet Governance Board oversees the development of secure health and disability information exchange and the supporting policies. In addition this group provides accreditation and compliance support against these activities to the Ministry of Health.

The ministerial committee for information standards (HISO) oversees the development and ensures co-ordinated implementation of sector standards required to support ehealth activities. Standards are critical to the realisation of HIS-NZ, and the role of HISO will be paramount.

The DHB Information Systems Strategic Plan (ISSP) Framework is a common template and table of contents for DHB strategic information systems plans. It ensures that the contribution of IS to national strategies and improved health outcomes is transparent as well as helping to share knowledge, expertise and successful solutions.

The framework is supported and maintained by a sub-committee of the DHB Chief Executive Officer (CEO) Group: the DHB CEO IS Group. Its purpose is to specifically address strategic information systems issues on behalf of the wider CEO Group. It sponsors the DHB CIO Forum, providing CIOs with a strategic agenda and closer alignment with DHB CEO priorities.

The DHB CIO Forum meets as a combined group quarterly where all DHB CIOs meet to discuss issues, share knowledge and experience, and be briefed on topical subjects.

The DHB ISSP Framework:

- **forms part of a DHB's Asset Management Planning process**. 'Information technology enabling efficiency and health gains' is one of the four asset classes, and the ISSP comprises one of four asset management plans requiring annual updating, the others being Strategic Asset Financing Plan, Strategic Asset Management Plan, and the Facilities Management Plan

- **is integrated with the District Annual Plan (DAP) cycle**. ISSP updating occurs in parallel with DAP development, ISSPs are finalised after DAPs are approved

- **provides more transparent links to DAPs and Business Plans.** The structure adopted by CIOs has been to identify current and future information and information system needs around business priorities (eg, Child Health, Mental Health, Population Health) rather than traditional 'clinical systems' and 'corporate systems'. This better aligns to the priorities and needs of DHB business units and better articulates the value (or otherwise) provided by information systems resources

- **supports regional collaborative efforts**. The framework allows for the capture and communication of collaborative initiatives outside a DHB district, for example, the tertiary referral networks outlined in *Roadside to Bedside*[7]*, or to accommodate shared service arrangements the DHB is party to*

- **reduces duplication by standardising common components.** The framework proposes that each DHB as part of their ISSP need not develop components of the ISSP that can be completed regionally or nationally. These components can be sourced either from national planning material (eg, trends in health technology) which are either produced centrally or developed from time to time by a particular DHB, or from within regional collaborative efforts

- **provides easier sharing of best practice, benchmarking and collaboration.** As the framework provides a nationally consistent table of contents for ISSPs, it will be significantly easier to review and contrast information management priorities, capabilities and priorities with those of other DHBs. As part of the development of the framework, the Ministry has established a collaborative website for CIOs to share ISSPs and other appropriate knowledge.

Over the next 3 to 5 years DHBs, along with their provider organisations, will need to plan for the development of the information capability of their broader network of care providers in their district: general practice, community and other primary care providers. Their role in prioritising Action Zones is fundamental to encouraging the innovative use of information so that we can improve the health and independence of New Zealanders.

Community providers, including NGOs, community groups and residential care providers, need to develop long-term plans for information and technology that are driven by the benefit to consumers through their participation in the continuum of care in their district.

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[7]   Ministry of Health, Health Funding Authority, Accident Rehabilitation and Compensation Insurance Corporation, Council of Medical Colleges in New Zealand. 1999. *Roadside to Bedside: Developing a 24 hour clinically integrated acute management system for New Zealand*. Wellington: Ministry of Health.

DHBs have a leadership and mentoring role in developing the capability of community and primary care providers up to the level currently maintained by most general practices. Otherwise, co-ordinated care initiatives will be constrained by the lowest common denominator – lack of computers or inability to connect or communicate efficiently.

6.   Making sure primary care providers plan for IS in a consistent and transparent way

The Independent Practitioner Association Council (IPAC) have established a primary care CIO forum, encouraging the alignment of information capability, the sharing of knowledge, and the potential efficiencies that come from co-ordinated investment. This group will play an important role in establishing dialogue with DHBs, the Ministry of Health and ACC about the implementation of HIS-NZ.

7.   Developing collaborative frameworks in a community setting (NGO)

The community setting has not yet formally developed a collaboration capability or formed strong links with national groups. With the implementation of population health, there is a need for community organisations to develop governance arrangements to deal collaboratively with issues of common interest. Such a group, for example, will play an important role in establishing dialogue with DHBs, the Ministry of Health and ACC about the implementation of HIS-NZ.

8.   Providing a national focus: the Health Information Strategy for New Zealand

The purpose of HIS-NZ is to develop a single and co-ordinated strategy of information systems, including current and emerging information, communications and technology ('IC&T') within the health and disability sector. The process seeks to develop consensus on vision, goals and activities for IC&T in the sector over the next five years. As illustrated in Figure 12, input to the plan exists at a local and regional level, as well as from other key information strategies such as those of the Ministry of Health.

Figure 12:   Links between HIS-NZ and other strategic IS plans
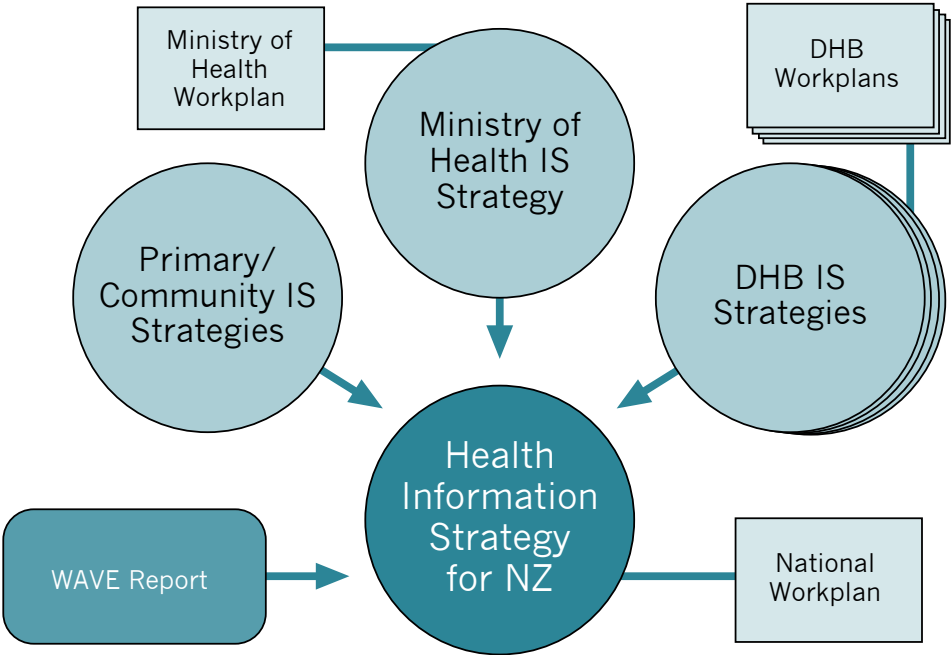
13 Guide H: Aligning Sector Capital Investment

13.1 Harnessing our collective investments

The delivery of health and disability services to meet the New Zealand Health Strategy and the New Zealand Disability Strategy requires building and maintaining health information and technology and systems across New Zealand. These facilities and systems combine to form the supporting tools and infrastructure for the delivery of health care.

To ensure a co-ordinated approach that best meets the whole of health and disability system needs, as well as balancing these alongside those of specific health care delivery units, a set of Guidelines for Capital Requests for Information Technology has been developed for the Ministry of Health and DHBs.

It is acknowledged that components of the health and disability system, such as GPs, IPAs, PHOs, community, disability and older people providers, have no formal framework for co-ordinating or planning IT spend with the rest of the sector, as they are largely autonomous organisations. It would, however, be advantageous to the system and its ability to effectively share information that these groups adopt a more formal approach to the co-ordination of investment despite their independence.

ACC has been instrumental in supporting the development of a range of information systems capability in the sector, particularly in general practice, through a variety of funding mechanisms that are consistent with their aims, and are in alignment with joint ACC and Ministry of Health information systems strategies.

The recent establishment of information systems sub-committees by the Community Laboratories Association and the IPA Council are positive steps towards greater co-ordination of investment across independent organisations. It is expected that future development of this guide will support these and other parts of the sector such as PHOs and NGOs where they are making significant investments in health information technology.

The Guidelines for Capital Investment will assist and guide organisations' investment decisions. It will ensure a culture of quality decision-making that includes a transparent set of review points for the wider group of health and disability system stakeholders in the expenditure of public monies on information technology. More importantly, it will also provide an opportunity to ensure that investment activity is well aligned and keeps pace with the goals of the major health care strategies.

The guidelines form part of a larger set of DHB planning frameworks, as shown in Figure 13.
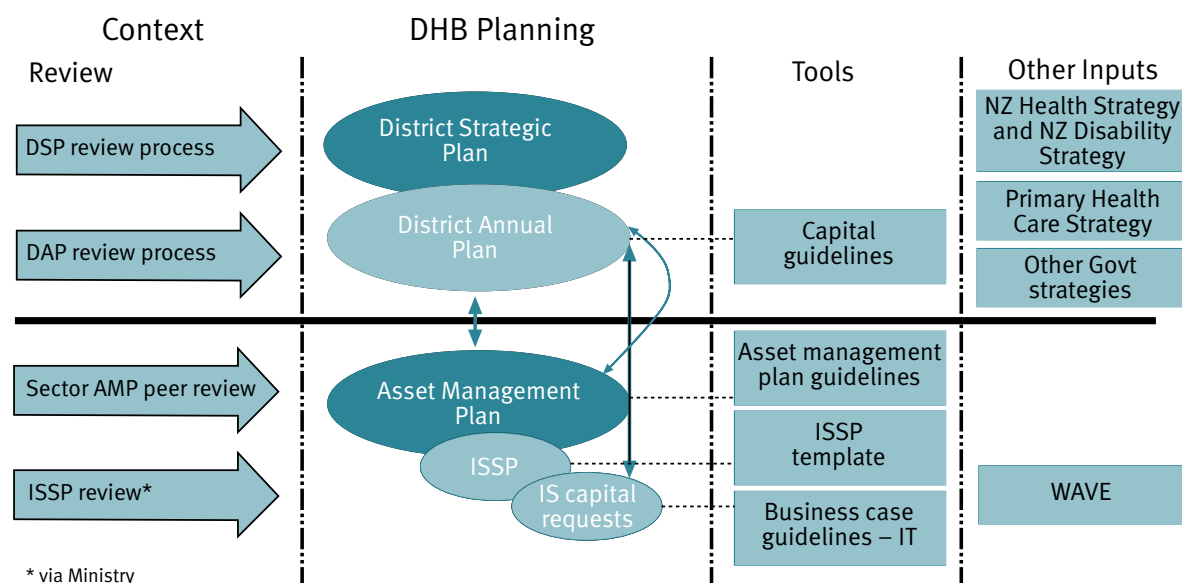
13.2 Guidelines for DHB capital investment

These guidelines define approval levels and thresholds for DHB capital investment, in terms of authorisation by the Minister, the Director-General of Health and the new Regional Capital Groups.

HIS-NZ will provide direction to both the providers and the funders in the health and disability sector in terms of sector priorities. In this respect it is expected that the funders of public services will adopt the capital and business case guidelines and ensure these are extended where possible to their contracted provider networks. The development of investment incentives for these organisations also needs to be considered.

The key factors for the success of the new sector capital investment process include:

- consistency in sector priorities (over time) so that organisations have time to implement and reap benefits
- regional Capital Groups that have the mandate and buy-in from their associated DHBs
- ensuring HIS-NZ successfully captures the sector priorities and that these are in turn reflected in investment decisions
- ensuring that the framework supports innovation within the sector
- ensuring clear incentives for organisations to participate in the process.

National capital framework

The objective of the national capital framework is to manage the Health Capital Budget and promote the objectives of the New Zealand Health Strategy and the New Zealand Disability Strategy.

Annual Capital Allocation Rounds define an annual process where District Annual Plans and District Strategic Plans confirm the DHB's objectives and budgets. Any new IT initiative must be consistent with these plans.

For IT projects to proceed, evidence is required that all collaborative opportunities have been explored. To meet this requirement, DHBs should seek written support from the other DHBs that proposals are consistent with key objectives.

The intention is to use sector peer review to ensure that proposals minimise the level of risk associated with new IT implementations, maximise investment already made on existing systems, and focus future IT investment on health and disability care provision rather than on technology.

The National Capital Committee (NCC) has been established to lead and facilitate an expert central capital advice capability. The Committee provides a whole-of-sector view on capital and advice on capital investment as input to the Ministry's advice to the Minister.

Regional Capital Groups (RCGs) have also been established to ensure that all opportunities are taken to gain maximum value from capital expenditure and avoid unnecessary duplication, enable procurement co-ordination, enable regional prioritisation, and provide a peer review.

Business case development

Approval of a business case is complex, potentially expensive and time-consuming. This staged process is intended to facilitate an informed, effective and timely consideration of the case by the Crown and mitigate against the risk of work being undertaken that will not secure Crown support.

To enable the logical development of a business case, a three-stage process is to be undertaken comprising:

1. Strategic stage
2. Options analysis stage
3. Completed business case stage.

14 Guide I: Accountability Framework

14.1 The framework for managing accountability in the health sector

This section describes key elements of the framework for managing accountability in the health and disability sector that will be critical to implementation of HIS-NZ. It describes the role of legislation such as the New Zealand Public Health and Disability Act 2000, the Ministry of Health's Operating Policy Framework and the DHB District Annual Planning Process. It also outlines the roles of a number of key organisations including shared services agencies of DHBs.

The current health and disability sector accountability framework is important to HIS-NZ because it will provide the most effective mechanism to direct activity, channel funds and monitor outcomes. As the accountability framework already exists, it will provide a fast start to implementation. It will also require less explanation, as most sector participants recognise it as the current formal way for government and the sector to set priorities, direct or co-ordinate activity, and use consistent methods across a distributed setting. HIS-NZ will leverage the existing sector accountability framework to achieve its goals.

The accountability framework seeks to ensure that the implementation strategies of organisations in the sector (including DHBs, the Ministry of Health, ACC, PHOs) will account for workforce issues and change-management needs, not just technology.

Where there is less capacity to co-ordinate change or set priorities across a part of the sector, consideration will be given to extending the current framework. More direct participation will be invited from areas such as pharmacy, community care and long-term residential care in the implementation of HIS-NZ.

DHBs have a key role to play in improving the information systems capability of the primary and community sectors as part of their role in implementing the Primary Health Care Strategy. The recent decision by the Hutt Valley District Health Board to invest $250,000 in the information systems capability of their primary and community care providers is a good example of the leadership DHBs can show to assist implementation of HIS-NZ.

ACC has for some years provided a range of incentives to encourage greater adoption and use of information systems, so that they can enhance the processes with which they manage, co-ordinate and pay for services to their claimants (eg, payment of $1 per claim billed electronically).

14.2 The New Zealand Public Health and Disability Act 2000

The New Zealand Public Health and Disability Act 2000 established DHBs – a key step in moving to a population-based health system. The DHBs are supported by the Ministry of Health, which provides national policy advice, regulation and funding, and monitors the performance of agencies. The Act also requires Parliament's oversight of

two overarching strategies for the health and disability sector: the New Zealand Health Strategy[8] and the New Zealand Disability Strategy.[9]

The Minister of Health has overall responsibility for the health and disability sector. The Minister, with the assistance of the Ministry of Health, determines the health and disability priorities, and negotiates with government colleagues the amount of public money to be spent on the public delivery of services.

14.3 The role of the Ministry of Health

The Ministry of Health:

- provides policy advice on improving health outcomes, reducing inequalities and increasing participation

- acts as the Minister's agent

- monitors the performance of District Health Boards, and other health and disability sector Crown entities

- implements, administers and enforces relevant legislation and regulations

- provides health information, and processes payments

- facilitates collaboration and co-ordination within and across sectors

- provides nationwide planning and maintenance of service frameworks

- plans and funds public health and disability services, disability support services and other services that are retained centrally.

As part of fulfilling its functions, the Minister of Health enters into agreements with DHBs through an accountability framework comprising:

- Operating Policy Framework – specifies what the DHBs are required to do each year

- National Service Framework – defines the range of services DHBs are able to provide

- DHB Performance Indicators – monitor the performance of DHBs

- Guidelines for Planning – DHB District Strategic Plans (three-yearly) and District Annual Plans.

14.4 The role of DHBs

DHBs are responsible for planning, funding and ensuring the provision of health and disability services to a geographically defined population; this includes the delivery of services through hospitals, primary care and community providers. Population-based funding signals the implementation of a collaborative culture within the sector. Funding is allocated to DHBs using a funding formula weighted by population health need, for the DHB to provide services itself or through external providers.

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8 Minister of Health. 2000. *New Zealand Health Strategy*. Wellington: Ministry of Health.

9 Minister for Disability Issues. 2001. *New Zealand Disability Strategy*. Wellington: Ministry of Health.

DHBs are responsible for improving, promoting and protecting the health and independence of their populations. Boards must assess the health and disability support needs of the people in their regions, and manage their resources appropriately in addressing those needs.

The Minister of Health provides broad guidelines on what services the DHBs must provide through the accountability framework and takes into account the national priorities identified in the New Zealand Health Strategy, the New Zealand Disability Strategy and the Primary Health Care Strategy. Services can be delivered by a range of providers, including public hospitals, non-profit health agencies, iwi groups or private organisations.

Implementation of the priorities of these strategies requires DHBs to interact effectively with community and primary care providers in the planning, co-ordination and provision of care to consumers. In particular, many of the priorities of HIS-NZ related to community and primary care providers are central to the successful implementation by DHBs of the Primary Health Care Strategy for their population.

DHBs present their intentions to the Minister through the Ministry of Health in two ways: District Strategic Plans which outline a five-year view of the health of their population and the services to be provided, and District Annual Plans which outline their activities and priorities over the forthcoming 12 months.

Collaboration amongst DHBs

Increasingly, DHBs have sought to share efforts to enhance the quality and cost effectiveness of shared services within a region. Key agencies include:

*   HealthAlliance – provides information services, finance and human resource functions for Counties Manukau and Waitemata DHBs

*   Technical Advisory Services (TAS) – provides regional data analysis, reporting and audit for central North Island DHBs

*   Health Intelligence – providing information services functions for Taranaki and Capital and Coast DHBs

*   Southern Shared Services Agency – provides regional data analysis and service contracting for South Island DHBs

*   Northern DHB Shared Agency – provides data analysis, contracting support for the three Auckland DHBs

*   Health Share – provides support to Midland DHBs.

14.5 Providers of health care services

Provider arms of DHBs deliver services such as hospital care, assessment, treatment and rehabilitation services, and some public health and disability services. Other services, including those delivered by GPs, PHOs, residential care facilities and midwives, are funded through agreements with DHBs or the Ministry of Health.

PHOs are responsible for providing a set of essential primary health care services to a defined population. These services are directed towards promoting wellness, preventing health problems through services such as immunisation, and first-line services to restore people's health when they are unwell.

A further range of services is provided by NGOs, including voluntary organisations. Not-for-profit services are provided by many national and local organisations. National organisations include IHC, the Plunket Society, the Family Planning Association and the Salvation Army.

14.6 The role of the Accident Compensation Corporation

ACC is a Crown entity. Under the Injury Prevention, Rehabilitation, and Compensation Act 2001, ACC provides universal accident insurance cover, injury prevention services, care management, and medical and other care and rehabilitation services.

ACC is responsible for the funding of ambulance and health care services for injured persons, either directly (in the first 24 hours or following acute inpatient care episodes in public hospitals, including elective surgery required as a result of an injury) with health and rehabilitation care providers, or indirectly through an annual service agreement with the Ministry of Health to fund DHBs (for acute care provided by DHBs). Its responsibilities are:

- preventing injury

- collecting accident insurance premiums

- determining whether claims for injury are covered by the scheme and providing entitlements to those who are eligible

- paying compensation

- buying health and disability support services to treat, care for and rehabilitate injured people

- advising the Government.

15 Action Zone Implementation Plan

15.1 Purpose

The ultimate goal of HIS-NZ and the combined Implementation Plan around the 12 action zones is to improve the health and independence of New Zealanders.

HIS-NZ sets specific benchmark targets that we wish to achieve over the next 3 to 5 years. These targets focus on making gains in linkages between primary and secondary care, as well as improving the overall level of information sharing and collaboration across the sector.

The identified benchmark targets in the diagram below are a *minimum* for each part of the sector and are not intended to limit any particular organisation that chooses to evolve further, or faster. Some organisations in each part of the sector will exceed these targets and provide leadership for their peers as they evolve at a faster pace.

Figure 14 illustrates the wide range of existing capabilities within each sector segment. Some organisations are relatively close to reaching target benchmarks, while others have considerable gaps to close.

Figure 14:   Benchmark targets for HIS-NZ (3 to 5 year horizon)
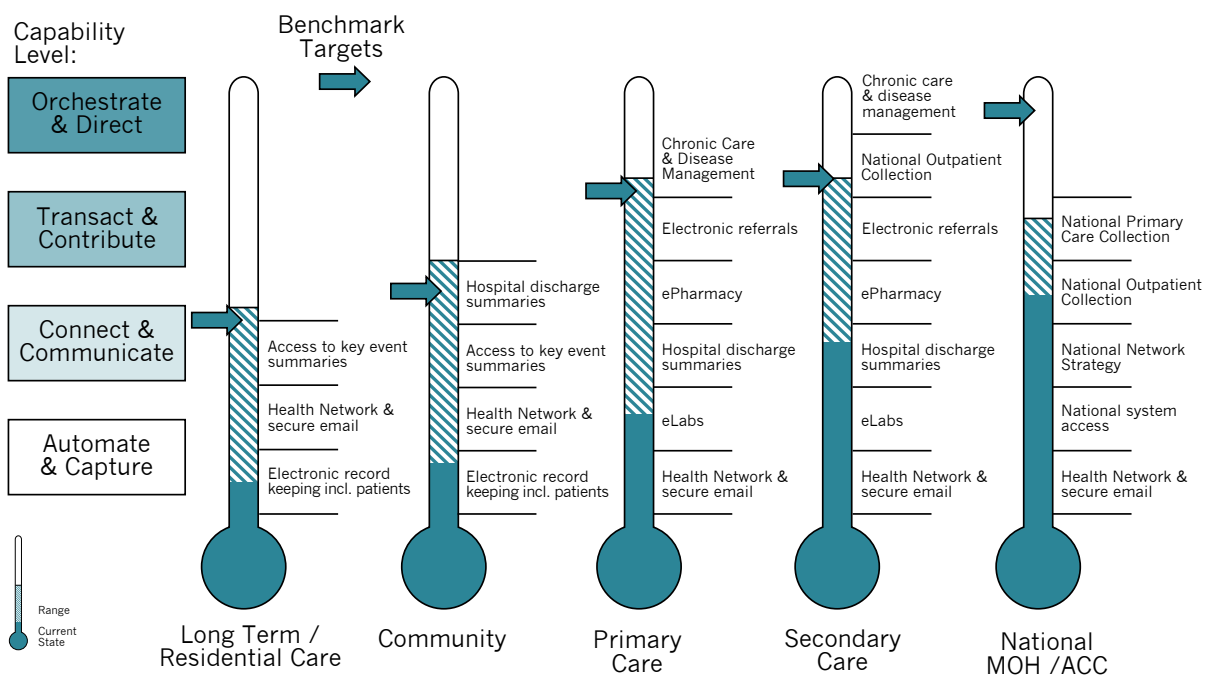
Collectively, the identified action zones and the specific steps outlined in the Implementation Plan need to allow each part of the sector to move ahead in building their capabilities. Because there is such diversity in existing capabilities, action zone projects need to acknowledge existing work where possible, but also focus on equitably and pragmatically moving the rest of the sector forward.

The impact of activities under each action zone will vary for each part of the sector, given the different levels of their current evolutionary stage. Specific goals will be defined during the execution of projects under each action zone, but overall we would expect to see some of the capabilities and outcomes listed below for each part of the sector.

Table 4: Action zones

Action zone	Long-term/ residential care	Community	Primary care	Secondary care	National Ministry of Health / ACC
National network strategy	Gain access to secure email and the Internet	Gain access to secure email and the internet	Routinely use secure email and the Internet	Routinely use Internet enabled applications	Routinely use Internet enabled applications
NHI promotion	Ability to look up and generate NHIs	Ability to look up and generate NHIs	Routinely use NHIs and improve data quality	Routinely use NHIs and improve data quality	Routinely use NHIs and improve data quality
HPI implementation	Ability to look up HPI details	Ability to look up HPI details	Routinely use HPIs in transactions	Routinely use HPIs in transactions	Routinely use HPIs in transactions
ePharmacy	Able to access key event summaries on web	Able to access key event summaries on web	Participate in electronic prescribing	Routinely use electronic prescribing	Utilise ePharmacy data for analysis
eLabs	Able to access key event summaries on web	Able to access key event summaries on web	Able to order and report results electronically	Routinely order and report results electronically	Utilise eLabs data for analysis
Discharge summaries	Able to access key event summaries on web	Able to access key event summaries on web	Receive electronic discharge summaries	Routinely send electronic discharge summaries	Utilise discharge summaries for collections
Chronic care and disease management	Able to access key event summaries on web	Able to access key event summaries on web	Routinely refer and guide care electronically	Routinely refer and guide care electronically	Utilise information to improve guidelines
Electronic referrals	Able to access key event summaries on web	Able to access key event summaries on web	Routinely send and receive electronic referrals	Routinely send and receive electronic referrals	Utilise referrals for collections and analysis
National outpatient collection	Able to access outpatient data securely	Able to access outpatient data securely	Able to access outpatient data securely	Routinely produce OP event summaries	Utilise OP event summaries for collection
National primary care collection	Able to access primary care data securely	Able to access outpatient systems securely	Routinely produce primary care event data	Able to access primary care event data	Utilise primary care event data for collection
National system access	Able to access national systems securely	Able to access national systems securely	Able to access national systems securely	Able to access national systems securely	Web enable national systems for access
Anchoring framework	Able to access and analyse key event data consistently	Able to access and analyse key event data consistently	Able to access and analyse key event data consistently	Able to access and analyse key event data consistently	Consistent ability to link data across the continuum of care

15.2 Overview

A fundamental enabler for many of the action zones and for overall success of HIS-NZ is the engagement model through which projects are undertaken. In relation to their information management capability, different parts of the sector differ in their ability to engage at the strategic level in this area.

A key prerequisite therefore will be to identify and engage stakeholders in the early stages of each project. This will require for example that DHBs identify appropriate representatives to work with in primary care, community care or the NGO sector in their region. Without collaboration, the various projects are unlikely to succeed. Therefore different agencies need to develop their partnerships to a level sufficient enough to support joint projects.

The implementation plan illustrates that some time will have to be spent up front for building capabilities to partner and to create engagement models in each region.

The 12 action zones also have a number of dependencies that need to be taken into account for the overall implementation of HIS-NZ. For example, progress around electronic transactions such as eLabs or ePharmacy, requires advances to be made with the National Network Strategy. Similarly improvements in the NHI promotion and HPI implementation are required to support better electronic referrals and chronic care and disease management.

In addition to direct dependencies between action zones, the capacity of the sector as a whole to implement change must be considered in setting out the implementation plan. Particularly the development and setting of standards will often be on the critical path and therefore the workload for organisations such as HISO needs to be realistic.

The diagram overleaf illustrates the high-level timelines for the sequencing of action zone activities. The governance processes in place for executing HIS-NZ will be used to adjust timelines and project activities as the sector evolves.

In addition to the activities noted for each action zone, the diagram also shows key management milestones for HIS-NZ. These include specific activities around the release of HIS-NZ, annual reviews of progress and a revision after three years into the process.

The following sections will discuss each action zone in turn and describe the envisaged projects at a high-level, based on the illustrated timelines.

Action zone 1: National Network Strategy

Objectives

The National Network Strategy action zone will implement a national approach to improving the quality and speed of sector communications, recognising that:

- The reach of existing networks could be extended
- Connectivity must be both affordable and secure.

Current state

The Ministry of Health, ACC, DHBs, hospitals, PHOs and an increasing number of primary care providers are subscribing to the New Zealand Health Network. This consists of two virtual provider networks operating and linked nationally under the Health Network Code of Practice standards.

Affordability, and availability in some areas, continues to be an issue. In the area of community care, increased investment in terminal technology will be a prerequisite to connectivity. Further national infrastructure investments are required to ensure access to the 'doorstep' in a number of rural and remote communities. Similarly, the sector needs to co-ordinate and leverage whole-of-government initiatives, such as PROBE, that seek to enable electronic service delivery in New Zealand.

With the availability of expanding and alternative technology such as wireless, the standards for the establishment and use of secure networks need to be continually reviewed.

Case for change

Collaborative information sharing requires the ability to connect to a secure health and disability network. Connectivity is required if we are to realise benefits such as more co-ordinated care, greater knowledge sharing and collaboration amongst clinicians, or enabling policy and funding decisions to be made on the basis of more robust evidence.

The Ministry of Health, ACC and the DHBs have a role in the development of a business case, and in championing district and regional communication networks. Primary care and the community have a role in supporting the uptake and adoption of improved secure networking capability.

Key steps

Phase	Description	Timing
Business case	• Confirm the key stakeholders who need to be involved – NZHNGB, HISO, Telecommunications Carriers, DHBs, PHOs, IPAs, ACC and government departments such as Ministry of Health, MSD, MED. • Define the part each party will play, articulating their role and how they will be engaged with. • Take stock of current activities and existing infrastructure before scoping and planning the project. • Analyse the options and develop a business case for the project approach and activities.	June–Sept 2005
Develop agreements	• Confirm a national approach for the provision of secure network services that defines what will be provided nationally and what can be provided at a regional or local level. • Review new technologies such as wireless for secure network opportunities. • Define required service level agreements for a core network offering that includes a core Virtual Private Network (VPN) with basic services. • Confirm core security approach and associated policies (for suppliers and users), as well as the necessary accreditation for suppliers. • Negotiate where appropriate access and service agreements for the different stakeholders in the sector who require access to a secure network.	Sept 2005– June 2006
Service rollout	• Ensure the necessary governance and administration infrastructures are in place and functioning. • Ensure that the necessary telecommunication service provider(s) are engaged to develop and implement the agreed secure broadband network. • Roll out the secure network to the full sector with the required access agreements, in line with the negotiated agreements(s).	Jan 2006– June 2007
Extend infrastructure	• Review, develop and encourage opportunities to reduce the cost impact of secure broadband networks on coalface providers by volume discounts and the sharing of costs across the sector. • Extend the geographic footprint of the network further into remote and rural areas, in line with other whole-of-government initiatives. • Improve the bandwidth and performance of the available network, to deliver secure broadband capacity to a wider part of New Zealand.	Jan 2007– June 2008
Enhance value-added services	• Develop and assist the implementation of value-added services for use on the secure broadband network that enhance the ability of the sector to share and communicate information.	June 2007– June 2009

Action zone 2: NHI promotion

> **What are the problems we are trying to solve?**
>
> The NHI provides a unique identifier that can connect people across a continuum of care services. Programmes to improve the NHI's data quality and accessibility will be necessary to help more parts of the sector use this capability.

Key steps	Description
Policy development	• Analyse and review the implications of using the NHI to support a population health register in the health and disability sector. • Develop policy on broader use (eg, registration by dentists and pharmacists).
Data quality strategy	• Identify the key stakeholders that need to be involved, such as Ministry of Health, HISO, DHBs, PHOs, NGOs, ACC, researchers, and other users. • Develop a framework for data quality and an action plan for a series of rolling initiatives that will improve the data quality of the NHI.
Scope and plan	• Scope and plan the improvement initiatives, analysing the options and developing a business case for the different initiatives.

Action zone 3: HPI implementation

Objectives

As identified in the WAVE project, the HPI aims to implement unique identifiers that can be used for consistently referencing practitioners, agencies and facilities in the health and disability sector. Over time, the HPI needs to better support clinical communication and collaboration in a secure and trusted manner.

Current state

At the moment New Zealand does not have a consistent way of finding and securely identifying practitioners, agencies or facilities in the health and disability sector. Like the NHI, the HPI will be a fundamental anchor that will ensure clinicians and others using the secure health network can easily identify and communicate with other users of the network.

The current HPI implementation project intends to deliver basic registry functionality to the sector.

Case for change

It is important that we have a directory of providers and organisations involved in the delivery of services that is up to date and can provide relevant contact details to improve the safety and integrity of care in the sector.

It also enables providers to gain controlled access to health information or national systems, based on a provider's unique identity and role. This means that electronic transactions and messages can be securely exchanged.

The philosophical issues around HPI implementation need to be further discussed by the whole sector. The correct model needs to be designed, agreed and then implemented.

Key steps

Phase	Description	Timing
Policy development	• Identify and develop more detailed policy guidelines around the usage of the HPI.	Mar 2005– Jan 2006
Implementation study	• Confirm the key stakeholders who need to be involved.[10] • Define the part each party will play, articulating their role and how they will be engaged with. • Take stock of current activities and existing infrastructure against policy guidelines, before scoping and planning further developments. • Develop and design the solution framework and implementation options for the ongoing development of the HPI. • Include a proactive strategy for managing data quality around the HPI.	Sep 2005– June 2006

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[10] These are expected to include organisations such as New Zealand Health Network Governance Body (NZHNGB), HISO, DHBs, PHOs, IPAs, ACC, and government departments, such as the Ministry of Health and the Ministry of Social Development, as well as various registration bodies.

Phase	Description	Timing
Directory implementation	• Implement core directory functionality for the HPI that allows sector stakeholders to look up and identify health and disability service providers, as well as the organisations and facilities that they work for.	Jan 2005– Sept 2005
Transactions rollout	• Allow the directory to generate unique identifiers on demand. • Roll out the HPI as a unique identifier in the use of messages and standard data sets that are exchanged electronically in the sector (eg, HL7 messages for ePharmacy and eLabs). • Ensure that the HPI is used in the persistent records that are created (eg, discharge summaries), so that data can be accessed and searched for by HPI.	June 2006– June 2009
Identity and access management	• Extend the use of the HPI to include an ability to define roles and therefore to control access to health and disability information or national systems based on the HPI. • Potentially leverage the identity management capabilities for other projects that are creating repositories of clinical information that should be accessible from the point of care (eg, ePharmacy and eLabs).	June 2007– June 2009

Action zone 4: ePharmacy

Objectives	
The ePharmacy action zone aims to create the ability for systems to more readily share information with prescribing clinicians so that they can monitor and track the dispensing of medications they prescribe. Once this is in place, it seeks to extend this functionality to ultimately support electronic prescribing. The challenge is to automate existing processes to create a platform on which 'smarter' transactions can provide clinicians with decision support capability, ensuring better clinical outcomes while realising process efficiency gains.	
Current state	
Although 98 percent of New Zealand pharmacies are computerised, their systems cannot communicate with prescribing physicians or deliver a complete pharmaceutical profile of patients. This lack of connectivity not only creates an administrative burden but also increases the risk of compromised care.	
Case for change	
The potential to improve clinical decision making, patient care and to reduce the potential for serious harm to patients through ePharmacy is significant. ePharmacy includes electronic transactions between prescribers and pharmacies, improved coding, tracking the dispensing of prescribed pharmaceuticals, enabling decision support tools and providing a better basis for monitoring compliance.	

Key steps

Phase	Description	Timing
Business case	• Confirm the key stakeholders who need to be involved.[11] • Define the part each party will play, articulating their role and how they will be engaged with. • Take stock of current activities and existing infrastructure before scoping and planning the project. • Scope and plan the project, analysing the options and developing a business case and funding model for the preferred implementation approach.	June–Sept 2005
Define core standards	• Develop a detailed design and define the core standards for a message-based implementation of ePharmacy, based around the HL7 protocol. • Define the minimum data sets that should be associated with the various clinical (eg, prescription, dispensation) and administrative processes (eg, subsidy claim). • Define the reference data sets for coding transactions and minimum data sets (eg, national formulary, drug codes and dosage strengths).	Sept 2005–June 2006

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[11] These are expected to include organisations such as NZHNGB, HISO, pharmacists, DHBs, PHOs, IPAs, ACC and government departments such as the Ministry of Health.

Phase	Description	Timing
Policy development	• Develop and define policy around the use of the NHI and HPI, as well as access to these by pharmacists and other relevant stakeholders around ePharmacy. • Refine the policy around non-repudiation of electronic transactions and the use of electronic signatures for ePharmacy.	Sept 2005– June 2006
Message implementation	• Implement the core messages defined and agreed for ePharmacy for point-to-point communication of electronic information, leveraging the NHI and HPI.	June 2006– Jan 2008
Implement persistent (clinical) record	• Based on a feasibility study, develop a mechanism by which shared persistent records can be created, so that electronic repositories with ePharmacy data can grow over time to provide access to clinical data. • Implement the relevant repositories of clinical information so that care providers at the point of care can access and retrieve the information.	June 2007– Jan 2009

Action zone 5: eLabs

Objectives
Like ePharmacy, eLabs aims to improve clinical decision making, patient safety and substantially reduce waste through duplication. It will create an ability to monitor and track diagnostic tests from the point of ordering to the reviewing of results regardless of whether a test is performed in the community or in a hospital. Functionality can be extended from reporting of results to support the ordering of tests.
Current state
The ordering of laboratory and diagnostic tests is a core activity in the delivery of health and disability services, but nonetheless is frequently not automated. Although laboratory test results are increasingly becoming available electronically, they are not always communicated beyond the attention of the provider who placed the order. Often the data is not electronically shared between providers (eg, there is no mechanism for one GP to send a patient's file electronically to another GP).
Case for change
Without a complete picture at the point of care, there is a risk that care may be compromised through incomplete diagnostic information and that duplicate tests are ordered instead, thereby increasing costs of delivering care. As for pharmacy, the challenge is to automate existing processes to create a platform on which 'smarter' transactions can provide clinicians with decision support capability, ensuring better clinical outcomes while realising process efficiency gains.

Key steps

Phase	Description	Timing
Business case	• Confirm the key stakeholders who need to be involved.[12] • Define the part each party will play, articulating their role and how they will be engaged with. • Take stock of current activities and existing infrastructure before scoping and planning the project. • Scope and plan the project, analysing the options and developing a business case and funding model for the preferred implementation approach.	June–Sept 2005

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[12] These are expected to include organisations such as NZHNGB, HISO, laboratory providers, DHBs, PHOs, IPAs, ACC and government departments such as the Ministry of Health.

Phase	Description	Timing
Define core standards	• Develop a detailed design and define the core standards for a message-based implementation of eLabs, based around the HL7 protocol. • Define the minimum data sets that should be associated with the various clinical (eg, diagnostic and results information, normal ranges) and administrative processes (eg, subsidy claim). • Define the reference data sets for coding transactions and minimum data sets (eg, use of LOINC, SNOMED, Read and others).	Sept 2005–June 2006
Policy development	• Develop and define policy around the use of the NHI and HPI, as well as access to these by diagnostic service providers and other relevant stakeholders around eLabs. • Refine the policy around non-repudiation of electronic transactions and the use of electronic signatures for eLabs, as well as the 'viewing' of results.	Sept 2005–June 2006
Message implementation	• Implement the core messages defined and agreed for eLabs for point-to-point communication of electronic information, leveraging the NHI and HPI.	June 2006–Jan 2008
Implement persistent (clinical) record	• Based on a feasibility study, develop a mechanism by which shared persistent records can be created, so that electronic repositories with eLab information can grow over time to provide access to clinical data. • Implement the relevant repositories of clinical information so that care providers at the point of care can access and retrieve the information.	June 2007–Jan 2009
Develop decision support capability	• Develop the relevant policy and agree the relevant guidelines for the implementation of decision support at the point of care. • Roll out clinical decision support mechanisms at the point of care, using the persistent record of clinical eLab data.	Jan 2008 onwards

Action zone 6: hospital discharge summaries

Objectives

The aim of this action zone is to make key information from secondary care events more readily available. This will allow the delivery of primary and community care to be better informed and co-ordinated, leading to better health outcomes for clients.

At the same time, hospitals should look to expand the network of care providers to whom summaries are sent, eg, to a residential care provider. Timely dispatch of summaries should be extended to include summaries of outpatient visits and ultimately community services.

Current state

Although a majority of DHBs have implemented some form of electronic discharge summary in New Zealand, most are based on a point-to-point approach and do not create a persistent record that could subsequently be accessed by relevant care providers. There is a need for greater national consistency that allows providers, when appropriate, to access and receive discharge summaries irrespective of where a patient was discharged.

There is also a need to extend discharge information to include emergency department outpatient, mental health and community events.

Case for change

By making secondary care information more readily available, health outcomes for clients can be improved through better co-ordination and information in the primary care sector. This will improve the continuity of care across a variety of settings.

Discussion and agreement on nationally consistent templates will be a necessary first step.

Key steps

Phase	Description	Timing
Agree nationally consistent approach	• Confirm the key stakeholders who need to be involved.[13] • Define the part each party will play, articulating their role and how they will be engaged with. • Take stock of current activities and existing infrastructure before scoping and planning the project. • Analyse the options and develop a business case for implementing a nationally consistent approach. • Establish agreed priorities for the roll-out sequence.	Mar–Sept 2005
Define core standards	• Develop a detailed design and define the core standards for a message-based implementation of discharge summaries, based around the HL7 protocol. • Define the minimum data sets that should be associated with the various types of discharges from a clinical perspective (eg, ongoing medication instructions, relevant diagnostic information, follow-up requirements). • Define the reference data sets that should be consistently used in all discharge summaries (eg, NHI, HPI, Read, ICD-10, DSM-IV, SNOMED).	Sept 2005– June 2006

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[13] These are expected to include organisations such as NZHNGB, HISO, DHBs, PHOs, IPAs, ACC, and government departments, such as the Ministry of Health and the Ministry of Social Development.

Phase	Description	Timing
High priority discharge messages	• Roll out the high priority message-based discharge summaries, based on the agreed standards and priorities.	June 2006– June 2007
Other message implementation	• Implement the other types of discharge summaries based on agreed message standards as they become available.	May 2007– June 2009
Implement persistent (clinical) record	• Implement persistent records of discharge summaries, which can be searched and accessed by NHI and HPI for informing care delivery at the point of care.	June 2007– Jan 2009

Action zone 7: chronic care and disease management

Objectives

This action zone focuses on increasing the capability for information systems to provide decision support for the management of chronic conditions at local, regional and national levels, initially focusing on diabetes and cardiovascular disease.

It aims to improve the co-ordination of care between multiple disciplines and providers. Information systems also need to support care planning, assist in clinical decision-making through evidence-based guidelines and enable support for patient self-care.

In addition the enhanced capability of information systems will make available the kind of data that better informs policy and funding decisions.

Current state

Although some local and regional initiatives have shown early success, there are few national initiatives embedded in the way we deliver health care. A key current initiative is the Diabetes Get Checked Programme launched in June 2000. This initiative aims to improve the health of people with diabetes through a free annual check of the person's physical health, lifestyle and management of the disease. The programme enables regional and national analysis of specific diabetes-related indicators in primary care.

Case for change

In addition to being critical to New Zealand's long-term ability to understand and manage the system burden of these diseases, these systems will also help to reduce duplication and waste and improve the ability to target funding and interventions to areas suggested by best-practice evidence.

Key steps

Phase	Description	Timing
Agree nationally consistent approach	• Confirm the key stakeholders who need to be involved.[14] • Define the part each party will play, articulating their role and how they will be engaged with. • Take stock of current activities and existing infrastructure before scoping and planning the approach.	Mar–Sept 2005
National collection		
Feasibility study and business case	• Analyse the options and develop a business case for a national collection that supports an incremental rollout and enhancements over time. • Analyse the necessary investment, costs and resource implications for proceeding with a national diabetes and cardiovascular collection and compare these to the envisaged benefits.	Sept 2005–Mar 2006
Implementation	• Subject to the business case, implement the national collection.	Mar 2006–Mar 2008

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14 These are expected to include organisations such as NZHNGB, HISO, DHBs, PHOs, IPAs, ACC, and government departments such as the Ministry of Health and the Ministry of Social Development.

Phase	Description	Timing
Implement persistent (clinical) record	• Subject to the feasibility study, extend the collection to include a persistent record of clinical data, so that decision-making at the point of care can be improved through access to relevant clinical data.	Feb 2008– June 2009
Continuum of care approach		
Cardiovascular and diabetes design	• Some initial policy work on cardiovascular and diabetes information has already been completed, but more work is required around the design for this initiative. • Develop a detailed design to support the service delivery policy for cardiovascular and diabetes, covering the business processes, information architecture, reference data sets, guidelines and relevant standards for messaging.	Mar 2006– Jan 2007
Cardiovascular and diabetes implementation	• Implement the agreed service delivery model(s) for cardiovascular and diabetes in line with the identified programme of work. • Roll out improved disease management capabilities for cardiovascular and diabetes.	Jan 2007– Jan 2008

Action zone 8: electronic referrals

Objectives

Electronic referrals provide practical assistance to clinicians who wish to communicate with other care providers regarding the care and treatment of their patients. They may be seeking a second opinion, requesting the assessment of a patient by a care provider of another discipline, or advising the patient's usual care provider of a just-completed visit.

This action zone needs to develop a standard minimum data set for referrals between providers, focusing initially on implementing secondary care referrals from primary care and referrals to community service providers.

Because there is currently no consistent way of accessing best practice advice and information at the point of care, this action zone would also need to address the use of guidelines. In particular the infrastructure for workflow and routing of referrals needs to be developed.

Like discharge summaries, electronic referrals rely on consistent use of data standards, effective education and privacy management processes, and the mutual engagement of providers who wish to send and/or receive the discharge summaries or referrals.

Current state

Electronic referrals are in their infancy. Currently there are a variety of processes and protocols with regard to when and how referrals are made from one provider to another for specialist services, and assessment or further diagnostic work. Many are paper-based rather than electronic. The IT structures to advance electronic referrals are not in place.

Case for change

Choosing the right care pathway can make a big impact on overall health outcomes, can reduce the administrative burden on the sector and can considerably increase consumer satisfaction and convenience. However, this requires consistent clinical guidelines that describe the 'right path' needed at the point of care. It requires some automation to support the transfer of care from one provider to another so that collaboration can more easily occur.

Key steps

Phase	Description	Timing
Develop national guideline framework	• Although some work has been carried out on various clinical guidelines and specific initiatives (eg, gynaecology guidelines), there is no overarching framework. • Confirm the key stakeholders who need to be involved.[15] • Define the part each party will play, articulating their role and how they will be engaged with. • Take stock of current activities and existing infrastructure before scoping and planning the project. • Identify the currently available guidelines and protocols that are deemed to be best practice and collate these in a consistent format. • Publish what is available electronically and agree how the information will be kept up to date and current. • Create a reference framework and define the electronic publishing standards, so that developers of systems can leverage the information consistently.	June 2005–June 2006
Define guidelines	• Define an intervention pathway, based on the national health priorities. • Define specific clinical guidelines and protocols for best practice in those areas where a need has been identified.	June 2006–June 2007
Pilot guidelines and define standards	• Trial the guideline in a pilot setting that tests the intervention pathway as well as the required electronic referral capability. • Review the underlying assumptions, validate the proposed workflow for electronic referrals and assess the desired health outcomes. • Define and refine the relevant standards around minimum data sets that are required for the intervention pathway, leveraging the sector data sets (NHI, HPI, National Data Dictionary, etc). • Agree the relevant message transactions that need to occur and ratify these through the standards setting process with HISO (eg, asthma referral).	Sept 2006–June 2008
Roll out electronic referrals for the intervention pathway	• Confirm that the intervention pathway and proposed electronic referrals work. • Develop and strengthen relevant supporting systems and infrastructure around the intervention pathway, so that a national rollout can take place. • Roll out the actual intervention pathway with the corresponding electronic referral infrastructure to the sector.	June 2008

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15 These are expected to include organisations such as NZHNGB, HISO, DHBs, PHOs, IPAs, ACC, and government departments such as the Ministry of Health.

Action zone 9: national outpatient collection

Objectives

Health care in New Zealand is increasingly taking place in outpatient or community settings, with many more patient interactions occurring in those settings than in traditional inpatient settings. While a lot is known regarding what inpatient care is happening throughout the country, very little is known about outpatient activity.

This action zone is specifically focused on putting in place a national collection system for hospital outpatient data. This will significantly enhance data available for planning, provide greater evidence of changes to health outcomes, and enable funding to be better targeted to programmes in areas of high need.

Current state

Hospitals provide inpatient data to a national collection system that has been invaluable in getting a national view of what inpatient activities are taking place. There is currently no national collection system where hospital outpatient data is collected. In the absence of such a national outpatient collection system, the benefits experienced at a hospital level cannot be realised until such a system is in place.

The primary care sector is unable to easily access outpatient data that is often highly relevant to the management of patients in the general practice and NGO sectors.

Case for change

The overall productivity and effectiveness of service delivery cannot be judged by tracking inpatient measures alone – vastly more services are provided in outpatient and the community relative to inpatient services. Visibility of outpatient services will allow us to evaluate service strategies more effectively by looking at the patterns of care.

Clinical data on disease progression combined with outpatient utilisation data will support the development of better guidelines and referral protocols to improve the health and disability outcomes for clients. Linking outpatient data to inpatient data is a key first step in broadening our perspective towards an 'episode of care', rather than the traditional event-based perspective.

There are also difficulties in tracking inter-district flows of consumers between DHBs, and difficulties in understanding how the implementation of primary care initiatives are impacting the delivery of secondary care outpatient services. These could be addressed through improved outpatient information.

Key steps

Phase	Description	Timing
Feasibility study	• There has been some ongoing work around the development of an outpatient data set at national level. However, longer-term plans have not yet been developed. • Confirm the key stakeholders who need to be involved.[16] • Define the part each party will play, articulating their role and how they will be engaged with. • Take stock of current activities and existing infrastructure before scoping and planning the project. • Develop and evaluate the different implementation options (level of detail, extent of clinical content, etc) for a national outpatient collection, within a framework that allows the collection to mature and evolve over time.	Mar–Sept 2005
Business case	• Analyse the necessary investment, costs and resource implications for proceeding with a national outpatient collection and compare these to the envisaged benefits. • Develop appropriate funding models for a progressive rollout over time.	Up to Mar 2005
Develop standards	• Subject to the business case, define the core standards for a minimum data set that should be associated with the various types of outpatient consultations from a clinical perspective (eg, diagnosis, procedures performed) and an administrative perspective (eg, inter-district flow arrangements for funding). • Develop key message protocols around the collation of outpatient data, using the HL7 protocol and the reference data sets that should be consistently used (eg, NHI, HPI).	Sept 2005–March 2006
Roll out utilisation collection	• Subject to the business case, implement a solution for the national collection of outpatient data that supports utilisation analysis. • Implement data collection and analysis functionality at the unit level that at least links back to purchase code and type of service delivered.	Mar 2006–Sept 2007
Roll out clinical collection	• Subject to the business case, implement a solution for the national collection of outpatient data that supports clinical analysis. • Implement data collection and analysis functionality at the patient level (NHI) that includes clinical data, so that outcomes and the effects of different service delivery models can be assessed (eg, diabetes, cardiovascular, oral health, older people strategies).	Sept 2007–2009

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16 These are expected to include organisations such as NZHNGB, HISO, DHBs, PHOs, IPAs, ACC, and government departments such as the Ministry of Health.

Action zone 10: national primary and community care collection

Objectives

There is a major focus on enhancing primary and community care services in New Zealand, championed by the Primary Care Strategy. We need much more information available at a national and regional level on the effectiveness and utilisation of primary care services.

The aim of this action zone is to improve the level of information that is available at national and regional levels, so that effective delivery models can evolve. In particular we need to get a better view of clinical and administrative data for primary care.

From an administrative perspective, there are no standardised performance measures and only aggregate data is available to see how effective our service delivery models are. There is a need to link primary care and community data with outpatient data, to allow researchers and clinicians to broaden their 'episode of care' analysis.

This means that the management of injuries and chronic conditions can be much more effective.

Current state

Other than some of the national payment systems and the National Immunisation Registry (NIR) project, there is currently very little national primary care or community collection of data.

Many IPAs and some PHOs have significant clinical and utilisation data in general practice, but sharing beyond organisational boundaries is limited. Discussions need to occur over the nature of the data collected, its repository and the access to, and use of, the collection. This is imperative before IT structures are built and data collection begins.

The community sector contains a multitude of health and disability services. The technical capability of the sector ranges from providers with sophisticated computer systems to others with none. This action zone will need to scope existing capacity within the sector and identify where interventions from other action zones should be targeted.

Case for change

Over 50,000 consumers visit general practice services every day in New Zealand whereas approximately 1700 are admitted to hospital. Across all primary care providers, little is known about these interactions such as the incidence, severity and patterns of treatment for particular conditions or diseases.

Information that is needed for preventative care, such as immunisation data, is not readily available. Therefore initiatives such as the NIR must continue to proceed, so that overall population health can be improved.

Improving our understanding of primary care will allow us to reduce the burden of major diseases as well as preventable admissions to secondary care. It will also improve the co-ordination between secondary and primary care to be assessed routinely, so that potential bottlenecks can be addressed.

Key steps

Phase	Description	Timing
Feasibility study	• Confirm the key stakeholders that need to be involved.[17] • Define the part each party will play, articulating their role and how they will be engaged with. • Take stock of current activities and existing infrastructure before scoping and planning the project. • Develop and evaluate the feasibility of capturing different levels of primary care data (utilisation and clinical), within a framework that allows the collection to mature and evolve over time. • Identify providers most likely to benefit from increased connectivity and target these for development (eg, services already providing clinical treatment such as Family Planning Association, independent midwives, long stay hospitals, physiotherapists, rest homes, disability providers).	June 2005–Jan 2006
Business case	• Analyse the necessary investment, costs and resource implications for proceeding with a National Primary Care Collection and compare these to the envisaged benefits. • Develop appropriate funding models for a progressive rollout over time.	Jan–June 2006
Develop standards	• Subject to the business case, define the core standards for a minimum data set that should be associated with the various types of primary care consultations from a clinical perspective (eg, diagnosis, procedures performed) and an administrative perspective (eg, funding, co-payment and contracting details). • Develop key message protocols around the collection of primary care data, using the HL7 protocol and the relevant reference data sets (eg, NHI, HPI, CPT4, Read).	June 2006–Sept 2007
Roll out utilisation collection	• Subject to the business case, implement a solution for the national collection of primary care data that supports utilisation analysis.	Sept 2007–Jan 2009
Roll out clinical collection	• Subject to the business case, implement a solution for the national collection of primary care data that supports clinical analysis.	Jan 2009 onwards

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[17] These are expected to include organisations such as NZHNGB, HISO, DHBs, PHOs, IPAs, ACC, and government departments such as the Ministry of Health, the Ministry of Social Development and the Ministry of Education.

Action zone 11: national system access

<table>
<tr><td>What are the problems we are trying to solve?</td></tr>
<tr><td>A significant amount of information is collected nationally in New Zealand on the activity and effectiveness of health and disability services and the wellbeing of New Zealanders. Many stakeholders in the sector have limited or no ability to access national systems. We need to be able to access national systems by role, level of authorisation and data set in a consistent and granular manner. Improved technical infrastructure will give us this capacity.</td></tr>
</table>

Key steps	Description
Policy development	• Develop more detailed policy guidelines around the usage of data that has ended up in National Systems and in particular the purpose and/or the repurposing of this data from a privacy perspective (eg, should clinical data that was collected for the purpose of collation national statistics be made available to a provider for follow-up in response to a targeted population health initiative?). • Define the key roles and restrictions around access to national systems in general and access to specific repositories of information in particular.
Infrastructure preparation	• Design and develop the underlying infrastructure that needs to be in place in order to consistently manage access to national systems. • Develop and design the technical components required to authenticate, authorise, audit, protect and control access to national systems.
Business case	• Identify the broader stakeholder groups who need to be involved, such as Ministry of Health, HISO, DHBs, PHOs, NGOs, ACC, and the Privacy Commissioner. • Evaluate different mechanisms for making national systems available and identify the preferred options. • Develop a roadmap of access initiatives based on identified priorities that supports an incremental approach over time. • Develop a business case that considers the required level of investment, resource implications and benefits, to agree a funding model.
Roll out access initiatives	• Roll out the identified access initiatives in line with the roadmap.

Action zone 12: anchoring framework

What are the problems we are trying to solve?	

Underpinning a population-based health approach is the ability to identify, analyse and compare like with like, eg, the relative effectiveness of different treatment patterns for cardiovascular disease, or different approaches to immunisation or screening programmes. Frequently there is no common language through which information can be shared electronically. This leads to an inability to compare data (often collected in national systems) and difficulty in linking isolated data sets for analysis and comparison. A more holistic perspective is vital if we want to understand how to improve the effectiveness and quality of our care delivery or achieve better outcomes for priority diseases such as diabetes.

Key steps	Description
Business case	• Confirm the broader stakeholder groups that need to be involved.[18] • Develop a framework for a national data dictionary within which reference data sets, coding systems, minimum data set definitions and other related information can be collated and published electronically. • Develop a roadmap for defining and publishing elements of the national data dictionary based on priorities and their current state of maturity. • Develop a business case that considers the required level of investment, resource implications and benefits, to agree a funding model.
Define and publish national dictionary	• Confirm existing standards and available information that can be published as part of the national data dictionary. • Develop policy for mandating the use of the national data dictionary where relevant and in particular for 'anchor fields' that are needed to link information. • Define and publish data dictionary elements as they are agreed and confirmed.
Compliance initiatives	• As national dictionary elements are agreed and published, ensure that the relevant systems conform to the agreed standards. • Carry out remedial work on core national systems for mandated 'anchor fields' (eg, NHI and HPI) to ensure that information can be linked. • Support harmonisation of existing systems in the sector with the changes in the national data dictionary as it evolves over time.

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[18] These are expected to include organisations such as such as the Ministry of Health, HISO, DHBs, PHOs, NGOs, ACC, and other agencies.

Glossary of Key Terms

This document is intended to be as inclusive as possible of the entire health and disability sector. For sake of clarity, however, some words used in this report are meant to imply a wider and more inclusive meaning than they might typically do in everyday use. Key words include:

Applications	Refers to information system or computer applications – programmes that provide functionality to support a business process eg, a laboratory application would support laboratory test ordering and the reporting of test results.
Care providers	Includes all professions who provide either clinical or social care to consumers of health and/or disability services.
Clinical decision support tools	'Active knowledge systems which use two or more items of patient data to generate case-specific advice.'[19] 'Also known as expert systems, they contain clinical knowledge, usually about a very specifically defined task, and are able to reason with data from individual patients to come up with reasoned conclusions. Although there are many variations, the knowledge within an expert system is typically represented in the form of a set of rules.'[20]
Community providers	All health and disability providers in the community that are not defined within primary care definition below. Includes public health, long-term care, residential supported accommodation, mental health providers and NGOs.
Consumer	Includes all those who experience an interaction with any health and disability service. Includes patients, clients, relatives of patients, whānau.
eLabs	eLabs refers to electronic transactions between clinicians and laboratories. It provides an ability to monitor and track diagnostic tests from the point of ordering to the reviewing of results, regardless of whether a test is performed in the community or in a hospital.
ePharmacy	ePharmacy refers to electronic transactions between prescribers and pharmacies. It includes and enables improved coding, tracking the dispensing of prescribed pharmaceuticals, the use of computer decision support tools, and provides a better basis for monitoring compliance.
Information systems	Used in the broadest sense to imply all processes, information, communication and technology and people for systems that support information use.
NHI	National Health Index. A unique patient identifier that ensures the right patient's information is available to clinicians and supports key national systems and safety measures like the Medical Warnings System that records known allergies and drug reactions.
Point of Care	Refers to the time at which a consumer is interacting with their care provider – traditionally, this has been for instance when a patient is seeing their GP or a care provider is physically at a patient's bedside, but use is expanding to include any simultaneous interaction between a consumer and their care provider eg, Telehealth.

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[19] JH van Bemmel, MA Musen (eds). *Handbook of Medical Informatics* (website v3.3).

[20] Coiera E. *Guide to Health Informatics* (2nd ed).

Primary care	Essential health care based on practical, scientifically sound, culturally appropriate and socially acceptable methods that is:
	• Universally accessible to people in their communities
	• Involves community participation
	• Is integral to, and a central function of, New Zealand's health and disability system
	• The first level of contact with our health system (including generalist first-level services like general practice services, nursing services, community health services, pharmacy services as well as first level services for certain conditions such as maternity, family planning and dentistry).[21]
Secondary care	Used to refer to all hospital based services, including tertiary and quaternary services.
Sector	Implies the wider health and disability sector.
Taonga	Māori for 'treasures' – used in the context of describing national information taonga; information collected nationally within the context of the Health Information Privacy Code is essential for the support of population health and PHO-based activities.

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[21] Minister of Health. 2001. *The Primary Health Care Strategy*. Wellington: Ministry of Health.

Appendix 1: Health Information Strategy for New Zealand – Steering Committee

Chai Chuah

Chai Chuah has been Chief Executive of Hutt Valley District Health Board since August 2002. Prior to that he had been with Canterbury DHB in a variety of roles from 1990. He was General Manager of Finance, Information Systems and Logistics and was Acting Chief Executive of Canterbury DHB for seven months during 2001.

Originally from Malaysia, Chai is a graduate of Canterbury University. His earlier career was in chartered accountancy and general consultancy.

Chai chairs the DHBNZ CEO Information Group, is a member of the Health Information Standards Organisation (HISO), chairs the Central Regional Technical Advisory Services (TAS), and is a member of the DHBNZ CEO Workforce Development Group.

Debbie Chin

Debbie Chin is the Deputy Director-General of Corporate and Information at the Ministry of Health. The role includes responsibility for health information strategy and policy, the business units of HealthPAC, ITS (Information Technology Shared Services) and NZHIS.

Previous experience includes a four year secondment to the Department of Prime Minister and Cabinet, covering Health and ACC. Debbie has also served as a member of the National Health Committee, the Wellington Trustbank Community Trust and the Public Sector Committee of the Institute of Accountants.

Currently Debbie is a member of the Ministerial Committee on Health Information Standards (HISO) and the State Service Commissioner's e-gif Committee. Debbie is also convenor of the Health Intranet Governance Board, Health Practitioner Index Steering Group and NHI Upgrade Steering Group.

Paul Cressey

Paul Cressey, Chair of the NZ Health Information Standards Organisation, is a member of Counties Manukau District Health Board, and chairs the CMDHB Community and Public Health Advisory Committee. He is Chair of the New Zealand Health Network Governance Body, a member of the Injury Surveillance Ministerial Advisory Panel, Chairman of Ronald McDonald House Auckland, and a past chairman of The Child Cancer Foundation. He was a practising retail pharmacist for more than 20 years and has held positions as chairman and executive director in cooperative pharmaceutical wholesalers. As Managing Director of East Health Services, and a Trustee of East Health PHO Paul was actively involved in the implementation of the Primary Care Strategy.

As a member of the WAVE Board, Paul was, and continues to be, a strong advocate for health information standards that will maximise the opportunities for the delivery of better health care for the people of New Zealand, and in particular the integration of both primary and secondary care.

Doug Baird

Douglas Baird graduated from Auckland University Medical School in 1977 and since that time, apart from his house-surgeon years, has been involved in general practice in Freemans Bay in Central Auckland. Doug has had a number of elected and advisory roles with Auckland District Health Board in several of its earlier incarnations, the NZMA, the ACC Medical Misadventure Unit, and the Health and Disability Commissioner. He was a founding member of the board of directors of ProCARE Health Ltd, a role he continues in, and has been on the executive of the IPA Council (IPAC) for four years, two as deputy-chair, and has been the chairman since October 2003. He has a Diploma of Obstetrics and is a FRNZCGP. His general practice has been computerised for 11 years.

Dr Pat Tuohy

Pat is a specialist paediatrician with a particular interest in community child health. After studying medicine at the Otago Medical School, and qualifying in 1979, Pat undertook postgraduate training in Paediatrics in Wellington, Melbourne and Nottingham. For three years he worked as a General Paediatrician in New Plymouth and joined the Plunket Society in 1991 as its Regional Paediatrician based in Wellington. Pat was later appointed to the position of Director of Child Health Policy in the National Office in Dunedin and in 1995 he was appointed to the role of National Paediatrician.

Dr Pat Tuohy took up the position at the Ministry of Health of Chief Advisor, Child Health, in December 1997. Later in 1998 Pat's position changed to include youth health. His responsibilities include coordination and leadership of child and youth health with respect to the Ministry of Health, District Health Boards and health service providers.

Pat's particular interests are in the areas of child health policy and developmental and behavioural paediatrics.

Louise Carr

Louise Carr is the CEO of PACT Group, a charitable trust based in Dunedin that supports people in Otago, Southland and the West Coast with intellectual disabilities and people recovering from mental illness. She has worked in the health sector for ten years including the Ministry of Health, the Health Funding Authority and the Southern Regional Health Authority. She has a particular interest in the NGO sector having been past Chair of the NGO Forum and represents this group on the HIS-NZ Steering Committee.

Doug Neilson

Since 2001 Doug Neilson has been employed by ACC in a range of strategic information management positions. As Manager, Information Strategy, Doug is responsible for the development and implementation of an eBusiness Strategy that aims to improve outcomes for claimants by enabling information flow between ACC and external organisations.

Before joining ACC Doug held several senior information management appointments including General Manager Information and Surveillance Services at the Institute of Environmental Science and Research, and Computer Services Manager at the Department of Survey and Land Information.

Mike Rillstone

Mike Rillstone is the Ministry of Health's Group Manager New Zealand Health Information Service. He was previously Chief Advisor, Health Sector Information and Technology. Mike joined the Ministry of Health in February 2002 from Cap Gemini Ernst and Young in Sydney, where he led the public sector practice. Mike's main objective in his current role is to work with the health sector to improve health outcomes through stewardship of national information.

Mike has extensive experience in both the health and IT sectors, spanning health care providers, the Health Funding Authority, and information technology vendors and universities in both New Zealand and Australia. His broad sector experience has him well placed to navigate the complex information and technology issues facing the sector. He has a special interest in health informatics, particularly the relationship between information and technology strategy and adding value to the clinical delivery of health care.

Brendan Kelly

Brendan Kelly is the Chief Advisor of the Health Information Strategy and Policy (HISP) Section within the New Zealand Health Information Service. HISP's role is to assist the Ministry of Health and the health sector to implement national information policies and strategies.

Brendan's previous role was as Programme Architect for the e-Government Unit at the State Services Commission. His responsibilities included programme direction and management; risk management and risk control systems; financial management; and internal alignment and management of e-Government projects. He also served as Project Manager for the Education Sector ICT Review, where he identified opportunities and mechanisms for driving increased collaboration between education sector agencies.

HIS-NZ Implementation Roadmap

Timeline: Jan 2005 — Jan 2006 — Jan 2007 — Jan 2008 — Jan 2009

Action Zones

HIS-NZ Management
- Build Engagement Capacity
- Review
- HIS-NZ Launch
- HIS-NZ Transition to Delivery
- Review
- Review
- Review
- Revise

1. National Network Strategy
- Business Case
- Development Agreements
- Service Roll-out
- Extended Infrastructure
- Entrance Value Added Services

2. NHI Promotion
- Policy Development
- Data Quality Strategy
- Scope and Plan
- Implementation of Quality Improvement Initiatives
- Ongoing Implementation

3. HPI Implementation
- Policy Development
- Directory Implementation
- Roll-out Planning
- Transactions Roll-out
- Identity Management and Access Management

4. ePharmacy
- Business Case
- Define Core Standards
- Policy Development
- Message Implementation
- Implement Persistent (Clinical) Record

5. eLabs
- Business Case
- Define Core Standards
- Policy Development
- Message Implementation
- Implement Persistent (Clinical) Record
- Develop Decision Support Capability
- Ongoing

6. Discharge Summaries
- Agree Nationally Consistent Approach
- Define Core Standards
- High Priority Discharge Message
- Other Message Implementations
- Implement Persistent (Clinical) Record
- Ongoing

7. Chronic Care and Disease Management
- Agree Nationally Consistent Approach
- Feasibility Study and Business Case (National Collection)
- Cardiovascular and Diabetes Design
- Implementation (National Collection)
- Cardiovascular and Diabetes Implementation
- Implement Persistent (Clinical) Record

8. Electronic Referrals
- Feasibility Study
- Develop National Guideline Framework
- Define Clinical Guideline
- Refine Guidelines and Supporting Standards
- Roll-out Electronic Referrals for the Intervention Pathway

9. National Outpatient Collection
- Business Case
- Development Standards
- Roll-out 'Utilisation' Collection
- Roll-out 'Clinical' Collection

10. National Primary Care Collection
- Feasibility Study
- Business Case
- Develop Standards
- Rollout 'Utilisation' Collection
- Rollout 'Clinical' Collection

11. National System Access
- Policy Development
- Business Case
- Infrastructure Preparation
- Roll-out Access Initiatives
- Ongoing Implementation

12. Anchoring Framework
- Business Case
- Define and Publish National Dictionary
- Compliance Initiatives