Better Business Cases

Strategic Assessment:
Establishing the Electronic Health Record

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Executive Summary

The New Zealand Health Strategy launched in April 2016 has set an ambitious goal of a people-powered, smart health system by 2025. The opportunity to utilise new health and digital technologies will be one of the ways to make progress towards this outcome. The Digital Health Work Programme 2020 has been designed to address the goals of the NZ health strategy.

This paper outlines a strategic assessment for an enabler of the Digital Health work programme, the establishment of an electronic health record (eHR) for New Zealanders. An eHR is a digital solution, or platform, that provides a single set of information for the benefit and use by individuals, health professionals (and their care teams). The information from the eHR will also be useful intelligence for health planners/funders and social service partners.

This initiative is closely aligned to the strategies being pursued by the Ministry and also shows direct connection to improving productivity, making the best use of information technology, ensuring the security of patient records and allowing digital access to information for the consumer.

Key Benefit for Patients

Patients won’t need to repeat ‘their health story’ whenever they engage with a new clinician. An eHR will be especially useful for people who are unable to speak for themselves, due to an acute event, or are unreliable due to a condition (such as dementia or acute mental health condition) or for those relocate around our country.

In addition, there is a growing awareness of the benefits arising from joining up health and social services data at critical points in the lives of New Zealanders. Health professionals want to know more about the background and social context of the individual they are engaging with, equally they support sharing information when a person is vulnerable or where they are missing out on appropriate government services.

The provision of integrated systems between hospitals, GPs, pharmacies, aged care providers and other community providers, supports clinical integration and will enable information sharing across and between regions.

- Clinicians will have access to correct and up-to-date information which increases patient safety, saves lives, reduces the need for repeat tests, saves time for clinicians and patients, and contributes to savings resulting from reduced acute admissions and readmissions.

- Patients will have access to their electronic health information, which will give them an opportunity to improve their wellness and self-management, encouraging healthier lives and connect them in smart ways with their care team.

Improving patient safety, should not be under played. Having the correct, up-to-date information on key aspects of the patient history, in a transparent, optimised fashion will greatly support decisions made by the clinician at point of care. The introduction of the eHR enables this as part of a smart sustainable health system.
As with all digital and IT investments there are risks associated with a project of this nature. While there are technology challenges, the greatest risk is related to the management of change in the sector at the time digital solutions are planned, designed and implemented.

Consumer confidence about the government potentially holding their health status data at a national level also needs to be fostered and maintained. The resulting project will require strong governance and leadership together with thorough stakeholder engagement, including co-design, to ensure successful implementation and realisation of benefits. Appropriate settings for privacy and security will need to be assessed, validated, and a key component at the centre of any potential solution.

A strong investment signal from the centre will be well received by consumers and health professionals. Expectations have been increasing, partly due to their experience of other digital services across the wider community e.g. online banking, access to current events, and other every day transactions that are online. Continuing to work in partnership with District Health Boards (DHBs), on this initiative will elicit a favourable response, noting the usual questions about funding and accountability. Getting the investment approach right will allow the health system to be a better partner within the social sector to meet Government priorities and to respond to the wider goals of the Government ICT Strategy.

Considerable engagement and collaboration has already taken place with the sector, consumer groups, providers and health care professionals. This engagement has provided positive support and advice that an eHR would be welcomed.

This strategic assessment has central agency support and is presented for noting by Investment Ministers. The subsequent stage of work, funded by the Ministry, is to develop an indicative business case to develop options for consideration, prior to proceeding to a further detailed business case on the chosen option. This approach allows prudent review and clear off-ramps and exit points for the Ministry and Ministers at each stage prior to requiring any significant investment to be made.
Introduction

The New Zealand Health Strategy has established the direction and five themes for focus for the health system over the next 10 years. Many of the changes to how the system functions will require professionals to have access to reliable information making it a critical component for the delivery of each of the Strategy’s five themes:

1. **People Powered**: access to reliable information enables health consumers to have an active role in managing their health and more convenient engagement with the system;
2. **Closer to home**: interaction with health professionals relies on remote access to accurate information, for example, video conferencing and remote monitoring;
3. **Value and high performance**: better clinical decision making and care coordination based on accurate information prevents errors, improves quality and reduces wasted time, leading to higher productivity;
4. **One team**: a single source of accurate and up to date information enables collaboration between health professionals and prevents a patient having to repeat their ‘story’;
5. **Smart system**: access to up to date information enables a learning system where insights are identified from the data to improve performance and effectiveness.

In response to the strategy, the Digital Health Work Programme 2020 (the programme) has been developed to progress the digital technology opportunities presented in the strategy. It forms the basis for the new set of investment signals from the centre along with delivering on the focus areas that together will drive towards a uniform information platform and a consistent data approach, across the sector.

The programme is a subset of the digital investments that are expected to occur across the health and disability sector in the next five years, 2016 – 2020, and therefore, sets the agenda for investment in the sector and will encourage health organisations (public, private and NGOs) to invest with greater clarity and confidence.

The five core components that make up the programme are described briefly below, as follows:

1. an **electronic health record** that will allow individuals to communicate their symptoms, preferences and experiences as a ‘health story’. It will collect and present existing health information into a single longitudinal view accessible to consumers, carers and decision-makers. It has the future potential to be a store of detailed information to support precision medicine, personal wellness information, and appropriate linkages to non-health data across the social sector; **This is the primary focus of this strategic assessment.**

2. **data to support health investments and the Government’s social investment approach** courtesy of the more complete, real-time, record of health status provided by the eHR;
3. a digital hospital blueprint that will assist DHBs to lift the digital capability within hospitals and the integration with the wider sector, which will include compliance with common standards needed to feed data into an eHR;

4. a national prevention IT platform to consolidate and improve the targeting of screening, immunisation and other public health initiatives;

5. district health boards complete regional IT investments, commenced under the National Health IT Plan 2010 to support the future direction outlined by the Digital Health Work Programme 2020 and informed by the digital hospital blueprint.

This strategic assessment focuses on the electronic health record project as a core capability that will provide real time access to decision support at point of care. This will continue to build on the increased confidence of healthcare organisations to share high quality information across the health system. If progressed this initiative will:

- enable patients to access their own personal data more easily;
- improve patient safety by enabling the attending clinician to see key health information about the patient on a real time basis;
- save clinicians time through improved productivity and faster referral; and
- enable individuals, local decision-makers in DHBs, national decision-makers in the Ministry of Health and wider social sector decision-makers to use data and information appropriately to support broader health and social investments and outcomes.

What is an Electronic Health Record?

An electronic health record (eHR) is a digital solution, or platform, that provides a single set of information for the benefit and use by individuals, health professionals (and their care teams), health planners/funders and social service partners. It is a representation of the underlying operating model across a health system and therefore, at its best, can support efficient and safe care delivery and also enable the introduction of new transformed service models.

Other industries have shown the quality, productivity benefits, and improved service experience that can be achieved through enabling a digital platform. A smart health system therefore needs to invest in this capability to both improve the current operating model and to enable the introduction of new transformed models of care.

**Definition an Electronic Health Record**

An eHR is commonly defined as

"a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting"¹.

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¹ HIMSS definition of eHR http://www.himss.org/library/ehr/
This definition, with a relatively broad interpretation to reflect changes in the use of digital technology, is the basis for the investment proposal for an eHR. Digital technology has become part of almost all activity across society today. In this setting including the longitudinal information collected on patients by devices, digital apps (including actions by the care team), wearables and customer interactions has the potential to offer significant benefits. A longitudinal eHR can capture an individual’s health story to support them as they live longer, focus on their wellbeing and seek treatment for a range of conditions.

Figure 1: Health care providers interacting with an individual’s electronic health record to support a full story of their health.

Please note: The definition does not include all the information commonly found within an Electronic Medical Record (EMR). While there are overlaps, an EMR contains more detailed records of medical information collected in a hospital or medical clinic setting (typically episodic based.)
Strategic Context

Organisational overview
The Ministry leads the health and disability system and has overall responsibility for the management, development and stewardship of that system. It steers improvements that help New Zealanders live well, stay well and get well.

The key aims of the Ministry are to improve, promote and protect the health and wellbeing of New Zealanders through:

- leadership of New Zealand’s health and disability system;
- advising the Minister of Health, and government, on health issues;
- directly purchasing a range of national health and disability support services; and
- providing health sector information and payment services for the benefit of all New Zealanders.

The Ministry and DHB’s employ in excess of 90,000 full-time equivalent staff and have annual expenditure in excess of $16B per annum. Its budget represents, approximately 10% of GDP (including out of pocket and ACC expenditure on health services) and has a significant economic impact on employment, tertiary training, immigration, development, and infrastructure investment.

Together the Ministry and DHBs invest more than $250 million per annum in digital/ICT and data services, which generates thousands of health technology jobs across the public health system, private organisations and NGOs. Over 100 private businesses provide software and/or IT services to the health system in New Zealand with many of these companies exporting digital solutions internationally (Orion Health being a prominent example).

Alignment to existing strategies
The Ministry has recently refreshed the long term goals for the system, in the context of the wider social sector, as set out in the New Zealand Health Strategy. (See Annex 3 for linkage between the eHR and the NZ Health Strategy action plans).

To support the development of the New Zealand Health Strategy, in early 2015 the Minister of Health commissioned an independent report, from Deloitte, to review the current strategy for eHRs in New Zealand. One of the recommendations from this report was support for an investment in an eHR for all New Zealanders, rather than continuing the current ‘virtual’ record approach. The investment in new technologies and digital solutions is a key enabler identified throughout the strategy and in the action plan that accompanies it.

In addition, having integrated information technology (IT) solutions is vital so that health information can be shared, and clinicians – and increasingly patients – can access it when and where they need it to provide seamless care to patients and enable patients to take greater control of their care.
The productivity increases from this and the ability to then make this information available appropriately to drive and assist social investments have the potential to be considerable.

**Sector Support and Leadership**

There is now a need for the Ministry to provide stronger leadership in the delivery of an eHR for New Zealand. With the release of the health strategy and a strengthened leadership mandate for the Ministry of Health, there is the potential for many issues to start to be addressed and managed to deliver the broader Health and Social Sector benefits that the eHR can provide.

However, this is not a project that can be run in isolation inside the walls of the Ministry. Indeed, writing a business case that does not fully engage the sector and take into account the varying needs, wishes and requirements of this diverse sector will be destined for failure.

**Transformative projects that are closely related to a National eHR**

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<td>integrated eMedical Record. (Scoping)</td>
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<tr>
<td>Midlands Region</td>
<td>eSpace: regional clinical workstation and clinical data repository. (Scoping)</td>
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<tr>
<td>Central Region</td>
<td>CRISP – Clinical Portal and PAS upgrades. (Rollout)</td>
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<td>Southern Region</td>
<td>HealthOne a portal for patient data for healthcare providers in hospitals</td>
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<td>and community care settings. (Rollout)</td>
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**Figure 2:** A number of sizable projects are closely related to the implementation of an eHR, taking into account learnings and interdependencies will be a critical task.

To provide the greatest chance for success a range of design principles will be developed for how the project will work in combination with the sector to support and enable the eHR, for example:

- We will utilise approaches like co-design and co-operating on important interdependencies that are underway (HealthOne, eSpace, CRISP, NEHR) so as to use learnings and also reduce rework on problems that may have already been solved.
- We will explore all options for solutions in the proposed indicative business case including those that are being developed in the regional projects mentioned above so that an optimal plan for investment can be understood and developed.
• We will communicate widely and take account of the communication needs, advice required and journey that needs to be taken hand in hand with the sector.

• We will engage, early and consistently with the Office of the Privacy Commissioner to make sure that they key elements of Trust and Confidence are designed into any potential solution from the outset.

• We will work closely with other key transformative projects that are taking place in Government (ACC, IRD and MSD) to take into account key learnings that they have made.

• We will continue to work closely with the Central Agencies, both through the Gateway review process but also through regular briefings with updates to key stakeholders and monitors.

Lastly we believe establishing a mechanism to make sure that working together in pursuit of the broader benefits take precedence. Building, securing and retaining trust in the process, potential solutions and direction of travel will be critical for all key stakeholders to work together on.
Case for Change

The implementation of an eHR for the health system is potentially more challenging than similar initiatives in other industries. Health has a highly professionalised workforce, a very wide range of stakeholders, an expanding range of traditional and new emerging technology options, and a critical need to be closely aligned to the way the devolved health system operates both now and in the future.

In addition, there are many different potential starting points depending on the opportunity or problem that is trying to be solved. This is one of the reasons countries with public health systems and large private or not-for-profit health systems, who are ahead of New Zealand in the investment cycle, have found the successful implementation of an eHR challenging to achieve. (See Annex 2 for International Experience in implementing an eHR). Investment signals need to be provided that maximise the outcome for all parties in the health ecosystem, mitigates the risks associated with the management of change and minimises the risk of competing investments.

All of these factors point to the importance of absolute clarity of the definition and scope of an eHR at the start of the investment process. The breadth, depth and longitudinal nature of an individual’s electronic health information needs to be considered when exploring the benefits across a range of health and wellbeing scenarios.

Wellness and better care co-ordination

New Zealand’s demographics are changing rapidly and as a result health services need to adapt to continue to keep pace with these changes. An aging population brings about key challenges that need to be addressed to manage and improve health outcomes. To be able to improve the health and wellbeing of New Zealanders, a conscious change is needed from the traditional health care model, where there is a wait for people to become unwell and attend hospitals and clinics, to a health system that partners with other social services and actively engages with people and their communities to deliver health services that support people to live well, at home, for as long as possible.

The drivers of health demand, also known as the burden of disease, have shifted from isolated episodes of significant ill-health to long term conditions that can be manageable or serious depending on how well they are managed. This leads to greater responsibility for individuals to manage their health conditions and to engage effectively with their care team and the wider health system. In addition there is an opportunity to enable better co-ordination of care for patients, well and truly supporting a team approach to providing a joined up care model at every interaction with the health system.

Without the guidance and leadership that needs to be provided by the Ministry, there is a risk that the ability to make this shift effectively will be impossible and along with it the benefits that could accrue to individuals and across the broader health and social sector will be lost.
An Electronic Health Record

An eHR offers the opportunity to support a wellness approach to health care, by creating a place where individuals can store their preferences and ‘health story’ along with existing health information into a single (longitudinal) view accessible to consumers, carers and decision-makers. It also offers the opportunity to significantly enhance the co-ordination of care as health services will be more readily joined up and available rather than manually requested.

There is demand for this type of view to support the needs and requirements of stakeholders as follows:

- health professionals want access to a current set of health status information and a longitudinal view of the health journey the individual has been on;
- consumers do not want to have to repeat their health story as they move through the health system;
- health system stakeholders want to utilise health outcome data to measure performance and be a better investment partner with the wider social sector. In the future there are potential benefits from a data platform to drive new models of care with new partners by utilising digital channels e.g. medication adherence apps; and
- in addition, broader use of information across different sectors to assist in managing and improving social outcomes offers opportunities to assist members of the public. This information will need to be carefully controlled and adhere to the level of privacy control that is appropriate for the collection and use of the information captured.

Digital Services can enable the change

There is an opportunity to utilise a full range of digital services and data techniques across health and social systems to enable a step change in the cost, quality and sustainability of health care. This will only be possible when citizens and the health workforce, along with a wide range of stakeholders, are engaged in the challenge to achieve greater value for money by:

- continual improvement in the effectiveness of models of care;
- making a shift to lower cost delivery channels with health professionals working at the top of their practice;
- a consistent adoption of proven healthcare solutions; and
- professionals sharing information across traditional boundaries to support the citizen to access joined up services.

The continued adaptation to a smart sustainable health system, signalled by the points directly above, can be enabled will the adoption of effective digital and data services. These services can trigger both a demand-side and supply-side response that will positively impact the cost, quality and sustainability equation. For example, digital and data services can:

- help to engage and empower citizens to improve their wellness and self-management, encouraging healthier lives and connect them in smart ways with their care team;
• support the delivery of effective, team-based, health services in the community and closer to a citizen’s home or workplace;

• increase the equity of access and productivity of high cost / hospital-based services by making clinical and administrative processes transparent, safe, efficient and effective; and

• support care teams and policy people to better target vulnerable cohorts of people who will benefit from early intervention and consistent access to government services.

**Delivering better health outcomes**

Delivering the change required will not be a trivial exercise. Careful planning and consideration will be required to continue to explore and confirm the core components for the introduction of an eHR and how this has the potential to build and renew capacity and capability in the health sector. Working together with central agencies and health sector colleagues will be important as we focus on enabling consumers, planners and the sector to deliver better health outcomes.

The Ministry is committed to supporting delivery of the Government’s Key Result Areas including through Supporting Vulnerable Children, our contribution to the Children’s Action Plan and through working closely with other Ministries can assist in the delivery of broader social outcomes.

The timing is now right to further develop how the costs and benefits of delivering the eHR can be assist with the prioritisation of goals for the next investment period through to 2020.
Key Stakeholders

Engagement

The development of an eHR has the potential to impact all parts of the NZ health system. It will promote access for consumers to their health information, in turn it also has the potential to enhance and change the way health services are accessed, potentially changing the way health professionals, care teams and health and social service organisations are organised and operate their services to meet consumer demands. As a core component of this change, there is potential for health professionals and consumers to agree to new ways of working based on digital-enabled work practices.

Key to the success of this initiative will be continued engagement with all parts of the sector to receive advice, review outputs and work together as described in previous sections.

To date the Ministry has run two workshops to engage with the sector, consumers, providers and clinicians. These workshops have been well represented and supported by those involved, and have shown a high degree of awareness, support and engagement from the key stakeholders with a wide range of views represented. As part of the development of the business case and subsequent design and implementation of the preferred solution, the Ministry plans to use a range of stakeholder management and engagement techniques, including co-design and co-production, to identify the best possible solution. In addition the Ministry has already scheduled regular meetings with other government transformation projects, health sector (DHB Chief Executives and Chairs), Regional ICT Groups and other key stakeholders.

Stakeholders

The following stakeholder groups have been identified and as part of the ongoing work in this area with a full stakeholder engagement plan to be developed as part of future stages of the business case. The groups are as follows: (examples are given but this is not intended to be an exhaustive list).

- **Government Ministers**: Minister of Health, Minister of Finance, Investment Ministers, Cabinet Committee’s (e.g. SOC)
- **Ministry of Health**: Internal stakeholders, Executive Leadership, Senior Responsible Officer,
- **Central Agencies**: Treasury, Department of Internal Affairs (GCIO), Department of Prime Minister and Cabinet, State Services Commission, Ministry of Business Innovation & Employment
- **Associated Government Departments**: Accident Compensation Corporation, Ministry of Social Development
- **Health Sector Groups**: District Health Boards, Regional Health Groups, Advisory Groups, Medical Colleges
- **Non-Government Organisations**: Office of the Privacy Commission, Consumer Advocacy Groups
- **Suppliers**: Technology & Business Advisors, Systems Developers etc.
Key Risks

Health executives, clinicians and consumers agree there is a compelling value proposition for a greater use of digital services including an eHR across a health system. However, in practice, the international experience in implementing an eHR has had mixed results. Annex 2 provides a summary of the international experience.

The national investments in eHealth and single eHRs in Australia, the NHS England and the United States of America have all been problematic. The common factor in the first two commonwealth counties was an over reliance on the design of the digital solution and the maturity of commercial software products, without fully assessing the ‘end to end’ value proposition at a workflow and process level.

As a result, health professionals were not convinced, did not trust the national system(s) and did not see value in changing their way of operating. They were concerned about ownership and stewardship of an individual’s personal health information. In the USA, the government has used a set of relatively generous investment incentives (as the system is predominantly privately funded and operated) to prioritise eHealth investments. This has resulted in lifting the investment level in eHealth across healthcare organisations, however, without consistently generating the quality and productivity benefits expected. There are important learnings from each of these international examples, in fact sometimes greater learning from the examples that have not performed as expected.

New Zealand is well placed

With this in mind it is highly apparent that the introduction of the EHR, will not be a simple initiative to implement. Many risks and issues will need to be managed and mitigated. New Zealand, however, is in a better position than many countries, with initiatives like the National Health index already in place, investments in regional solutions like HealthOne in the Southern region, CRISP in the Central region and NEHR in the Northern region all providing key building blocks for a potential national solution.

In addition, a number of countries have made good progress in implementing an EHR. Singapore, Sweden, Denmark, Scotland NHS, Israel and Kaiser Permanente are all examples where an eHR solution is in operation supporting all, or a substantive part, of the country's/organisation's health delivery operating model. The common factors being:

- strong governance and leadership with a clear understanding of the problem(s) the eHR solutions were solving;
- an implicit focus on stakeholder management, adoption and the change management that is required to help and assist the sector to gain the benefits of the change.
- a staged approach to implementation, taking into account the concept of a minimum viable product for initial implementation and then building on this with regular enhancements and functionality to improve ways of working.
Applying learnings to key risks

Taking the learnings into account and also acknowledging the differences in the delivery of Health Care in New Zealand compared to the overseas examples; we consider that the key risks can be summarised as follows:

1. That the enhanced ability to share an individual’s health information via the eHR, both within the health sector and across the social sector is perceived to be an invasion of privacy and as a result causes clinicians and/or the public to lose confidence in the solution.

2. That the intention to work closely together with the sector is not accepted by key sector participants and as a result barriers are created limiting the ability to deliver the benefits identified.

3. That competing investments within the District Health Boards on similar initiatives limit the ability to provide support for the overall project.

4. That clinicians and private practitioners resist the need to share information with the eHR, reducing the effectiveness of the overall solution.

5. That change management and communication with the sector is underestimated and as a result creates uncertainty and barriers to the implementation.

6. That clinical practices remain the same and do not take advantage of the potential operating model changes that a single EHR provides.

7. That the new operating model in place is too rigid and not flexible enough for clinicians to innovate and gain value form the new solution.

Mitigation strategies are already being developed for each of these risks with effort to manage and treat risks as they arise across the duration of the project.

It is already clear that, the implementation of the eHR will require careful attention to and management of the ongoing sponsorship in a devolved sector; changes to practice and workflow; and building trust in the data accessed (and having others trust your data) up and down the value chain. Making sure this is undertaken in a fashion where risks are carefully managed and, benefits are transparent and readily able to be consumed by all will be key.
Annex 1: Scope of an eHR

*eHR Investment Principles at a National Level*

Due to the devolved nature of the NZ health system made up of public, private and NGO organisations a commitment to a Single eHR is an important signal to decision makers and investors. It will demonstrate support for a People-Powered, One Team approach, as presented in the NZ health strategy and shows early progress against roadmap action number 26.2. At a practical level, a single eHR, signals to all organisations across the health system that the clear direction is the integration of their information and the key role the eHR solution can play in improving services in their part of the health or social sector value-chain.

There is support in the sector for the concept of a single eHR, including from senior DHB management3 and private sector organisations (e.g. primary care, pharmacy and aged residential care providers). However, the question of who pays will need to be explored through the business case as the different options (scope, benefits, initial investment, life-time costs and risks) are considered.

The scope of the option chosen for this investment will determine the level of potential benefits, which will need to be offset against the establishment cost, the cost of system integration, and the cost of change to accountabilities, roles and processes required within each healthcare organisation. It is our intention to work closely with the central agencies to develop clear investment objectives as part of the proposed Indicative Business Case process.

To get a sense of the potential size of an investment, Singapore invested US$100M to establish the longitudinal record across hospitals and publicly owned primary healthcare clinics, and have an annual operating budget of US$10M. In contrast, Australia has publicly reported investing $1.5B in a longitudinal record, however, their population is five times larger and they have greater fragmentation across their health system.

The following investment principles have been developed in response to the challenges set out in the Health Strategy and were guided by the findings of the Deloitte report:

1. **To provide a national view of an individual’s longitudinal record over time**: A set of person-centred Information will be available as the ‘trusted source’ of master information for that patient. This will support equitable access to systematic, high-quality care - especially targeting the initial clinical engagement and any points of ‘transfer of care’ to other health professionals or care teams.

2. **To provide a register of plans/pathways**: An individual’s care plans and care pathways that they are engaged in (including tasks and actions) will be available to health professionals or care teams to enable better care coordination

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2 New Zealand Health Strategy Roadmap of Actions – Smart System, Action 26: The Ministry of Health will establish a national electronic health record that is accessed through certified systems including: patient portals, health provider portals and mobile applications

3. **To provide tools to support self-management:** A range of tools for patient management and self-management that allow more meaningful participation in care and more opportunities for self-service will be provided.

4. **To provide real-time health status data:** There will be health information available nationally that monitors the health status of the whole population and key population cohorts to support health and social investments.

**Scope of the eHR**

Reviewing the definition and after applying the investment objectives, there is a preference to develop a national view of an individual's longitudinal record over time (which includes access to a wide set of health data via links), rather than a national data set of detailed episodic medical information.

While it will be important to test this hypothesis during the development of the business case, the following items propose, at a high level, what is in and out of scope for the establishment of an eHR:

**In Scope:**

- Customer / Client tasks and action plans, information about communication preferences and a way to capture the consumers’ health story from the individuals point of view
- Key health information of value to health professionals at the point of care, including: diagnosis, medications, previous admissions, allergies and alerts
- A register of health prevention information, services consumed in the health system; care plans and care pathways
- Application interfaces to support the access of an individual’s information by certified applications (that have been consented by the individual) and the capture of information from technology devices
- A mechanism to make health status data available to appropriate third parties.

**Out of Scope**

- Detailed medical information captured by specialists and health professionals in an electronic medical record (EMR)
- Clinical quality audit and / or outcome reporting systems
- Data stores or warehouses that are required by healthcare delivery organisations.

**Benefits of an electronic health record**

**Benefits for individuals:**

1. people can take a more active role in managing their own healthcare – symptoms information, communication with health providers, and up to date test results.

2. it reduces the need for people to repeat ‘their health story’ whenever they engage with a new clinician in their journey. It is especially useful for people who are unable to
speak for themselves, due to an acute event, or are unreliable due to a condition (such as dementia or acute mental health condition).

3. it is the gateway to changing how people can interact with their health professionals. A secure, real-time platform moves away from a doctor-centric model of healthcare where care is provided at the convenience of the health professional rather than being truly ‘people-powered’.

Benefits to health professionals:

4. clinicians see an individual’s health status evolving over time rather than a snapshot of part of the individual’s health.

5. better information at the point of care enables better clinical decision-making and reduces misdiagnosis and errors; more reliable medication alerts to reduce the chance of harmful interaction and could include alerts that relate to the individuals’ social circumstances.

6. faster and more reliable handover of notes, allowing clinicians to spend more time with people and less time chasing or poring over handwritten notes.

Benefits to the health system and planners:

7. better health outcomes and higher quality care.

8. freeing clinician time through better access to information will improve productivity when combined with changes in service design and in particular when professionals in the health workforce work at the top of their practice.

9. better outpatient care in the community and fewer readmissions.

10. integrated data will be generated for local decision-makers in DHBs, national decision-makers in the Ministry of Health, and wider social sector decision-makers.

11. over time it is expected that the benefits will lead to a reduction in avoidable hospital admissions and an increase in patient satisfaction. In fact, there are early indications from the Health Quality and Safety Commission research that hospital emergency departments with access to primary healthcare information have a reduced number of people over 75 who access emergency department care.

Benefits for provision of data to support health and social investments

12. New Zealand is fortunate to have a great deal of information on health system activity courtesy of the National Minimum Dataset provided by DHBs, which feeds into the Integrated Data Infrastructure operated by Statistics New Zealand (making the health sector one of the largest data contributors). However, this information merely paints a comprehensive picture of what health does; it does not provide such good information about unmet need – i.e. where health has missed an opportunity to intervene.

13. The eHR will provide a national view of the health status which will enable cohorts to be identified for example, the number of pre-diabetics compared to the number of diabetics, and the medications being prescribed to both groups. The individual’s health
status can be monitored overtime including co-morbidities, and the cost/benefit of different treatment options.

14. The broader health status information provided by an eHR will enable a step change in how the Government can make investment decisions, target public health initiatives, monitor the effectiveness of programmes, and will allow health to work more effectively with other agencies to improve outcomes. The impact of diabetics to the economy can be measured by looking at broader social outcomes e.g. employment outcomes for individuals in this cohort.
# Annex 2: International Experience

**Table 1: International Experience**

The majority of western economies have started to implement a national eHR over the last 5 – 10 years, with varying success. New Zealand is learning from each example below with close alignment to the more successful approaches taken in Denmark, Scotland and Singapore.

<table>
<thead>
<tr>
<th>Approach</th>
<th>Outcome</th>
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<tbody>
<tr>
<td><strong>Denmark</strong></td>
<td>Patient information is shared between 100% of general practices and Pharmacies. Consumers have read only access to their eHR on-line. Separate crown-entity leading the next phase of investment.</td>
</tr>
<tr>
<td>Primary Care-led, starting with medications information: First initiative was to link electronically prescription information between general practice and pharmacy in the community. Further developed the national eHR with lab results and allergies and adverse reactions information. Progressively populating the eHR with more complex hospital/specialist records.</td>
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<tr>
<td><strong>NHS England</strong></td>
<td>£12B invested initially up to 2009 with limited results. New approach focused on keeping the SPINE and enabling new services via an incremental investment model</td>
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<tr>
<td>Regional approach connecting to a national SPINE: The ‘Blair’ government created the largest Digital/ICT project in the world. The approach was ambitious, however, and lacked clinical leadership or buy-in. Clinicians refused to share information and the 4 main technology companies selected were not able to deliver to expectations. The approach was ceased in 2010 and completely re-thought.</td>
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<tr>
<td><strong>Australia</strong></td>
<td>$1–2B initially invested with limited results (did succeed in implementing a National Identity number – NZ has had this capability for 20 years.) Re-branded to ‘MyHealthRecord’ and new approach underway led by a ‘PHARMAC style’ organisation (from 1 July 2016.)</td>
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<tr>
<td>National consumer controlled eHR: In 2009 the Australia federal government invested in a national Personally Controlled eHR solution. Learning form the NHS England example they:</td>
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<tr>
<td>• reduced the scope of clinical information required to be in the eHR (they legislated that health summaries from clinical appointments must be sent to the eHR)</td>
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<td>• selected a single ICT vendor to lead the project</td>
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<tr>
<td>• Designed a complex privacy and security model and selected a consumer ‘opt-in' model.</td>
<td></td>
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<tr>
<td>Country</td>
<td>Description</td>
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| **NHS Scotland** | Basic eHR focussed on after-hours care:  
The Scottish NHS did not wish to repeat the English experience and choose to focus on a basic eHR with primary care information being available in after-hours clinics. This approach focused on addressing the concerns of GPs sharing patient health information, outside of their general practice. An agreement was made on after-hours coverage by GPs (and clinics) on the basis that GPs provided basic health information to the national eHR.  
For a modest investment a basic eHR is in place supporting after-hours clinics and the 24 hour 0800 telephone service in Scotland. Further services are being enabled incrementally. |
| **Singapore** | “One Singaporean, One Health Record”:  
In 2010 Singapore started the implementation of a national eHR. The process was clinically led and has focused on a core set of valued information being available across the publically funded health services. A single vendor has led the implementation.  
Utilised in public-funded clinics and progressively linking in hospital information. Good future plan, limited use in private sector. |
| **Sweden** | In Sweden EHRs are used for documentation by all physicians and most hospitals (and most ambulances). Hospital use has lagged use in primary care, but EHRs are now used in 97 percent of hospitals and 100 percent of primary care clinics. About half of the regions have adopted a single EHR system for both hospitals and primary care, and most of the others are moving in that direction.  
The creation of a single record allows hospital physicians (with patients’ consent) to have access to patients' primary care records and for hospitals to have reciprocal access. |
Annex 3: Alignment with the New Zealand Health Strategy - Action Plan

The following diagram, adapted from the New Zealand Health Strategy, shows the linkage of 15 key actions in the strategy to the creation of the eHR.

1. People Powered
2. Closer to home
3. Value and high performance
4. One team
5. Smart system

Electronic health record

NZ Health Strategy
Actions related to the EHR

Action 1a: Support self management
Action 1a: National Telehealth 0800 Service
Action 2a: Right services are delivered at the location
Action 7b: Telehealth Services
Action 8a: Target prevention and long-term conditions
Action 8b: Capture service users care plan in electronic form
Action 8c: Collaborate across agencies using a social investment approach
Action 10: Advanced care plans and advanced directives
Action 11: Advanced care plans and advanced directives
Action 12: Customer Feedback
Action 17: Cross-agency commissioning with focus on vulnerable populations
Action 18: Social Investment Approach
Action 19: Improve Quality and Safety
Action 22: One team approach
Action 25: Increase data quality and data analytical capability
Action 26: Single EHR

Electronic Health Record