Digital Health and DHHS Victoria
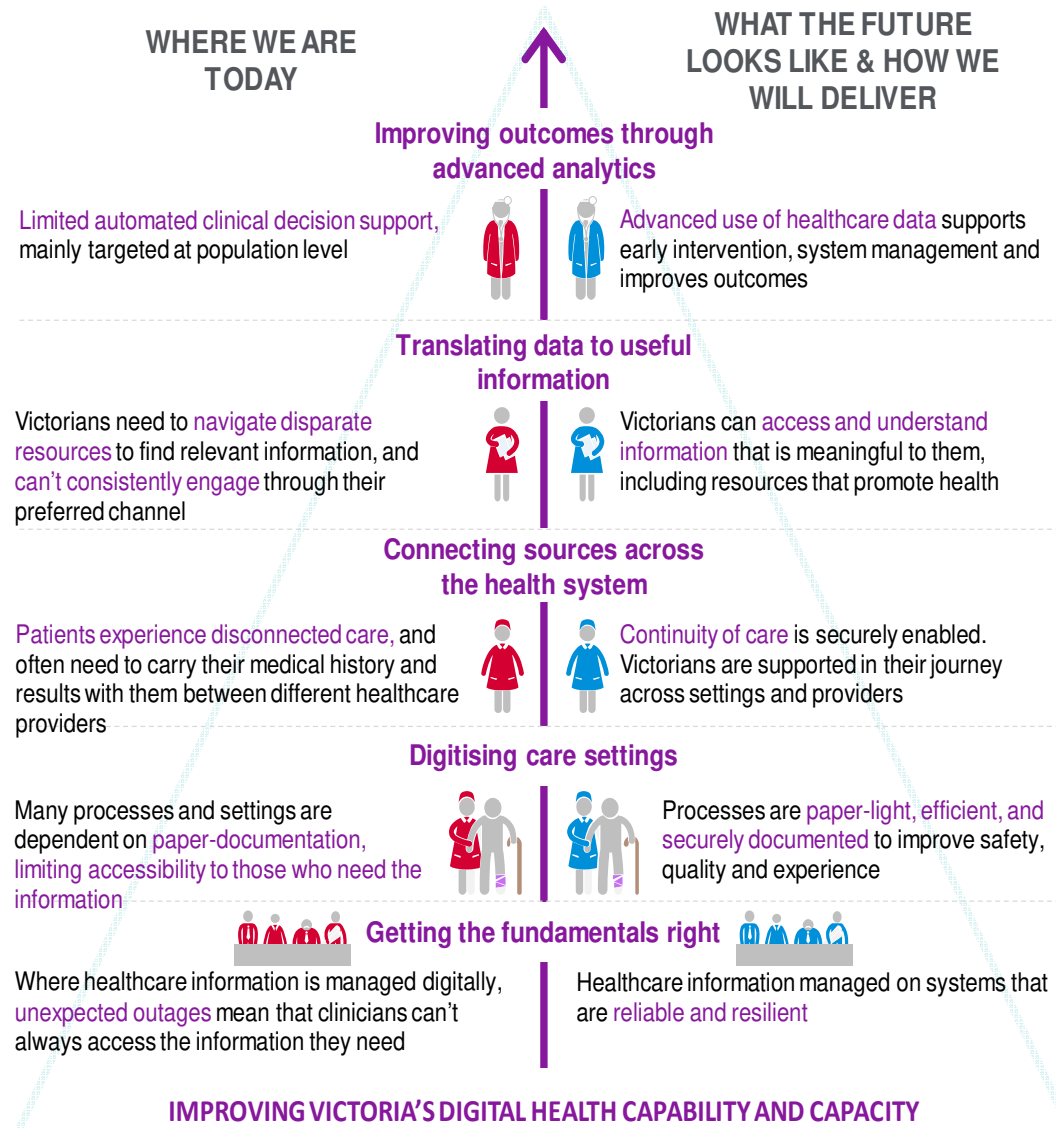
14 February 2020

Figure 3. Order Written for 8 Units of Lantus Insulin Misread as 80 Units

MS10023

Metprobamate 400mg ī Po BID

Lantus 8units SL Ø Daily ē Supper

ECASA 81mg ī Po Daily

Reprinted with permission from the Institute for Safe Medication Practices, Horsham, Pennsylvania.

Where do we want to land?

WHERE WE ARE TODAY

WHAT THE FUTURE LOOKS LIKE & HOW WE WILL DELIVER

Improving outcomes through advanced analytics

Limited automated clinical decision support, mainly targeted at population level

Advanced use of healthcare data supports early intervention, system management and improves outcomes

Translating data to useful information

Victorians need to navigate disparate resources to find relevant information, and can't consistently engage through their preferred channel

Victorians can access and understand information that is meaningful to them, including resources that promote health

Connecting sources across the health system

Patients experience disconnected care, and often need to carry their medical history and results with them between different healthcare providers

Continuity of care is securely enabled. Victorians are supported in their journey across settings and providers

Digitising care settings

Many processes and settings are dependent on paper-documentation, limiting accessibility to those who need the information

Processes are paper-light, efficient, and securely documented to improve safety, quality and experience

Getting the fundamentals right

Where healthcare information is managed digitally, unexpected outages mean that clinicians can't always access the information they need

Healthcare information managed on systems that are reliable and resilient

IMPROVING VICTORIA'S DIGITAL HEALTH CAPABILITY AND CAPACITY

Digital Health Maturity Model

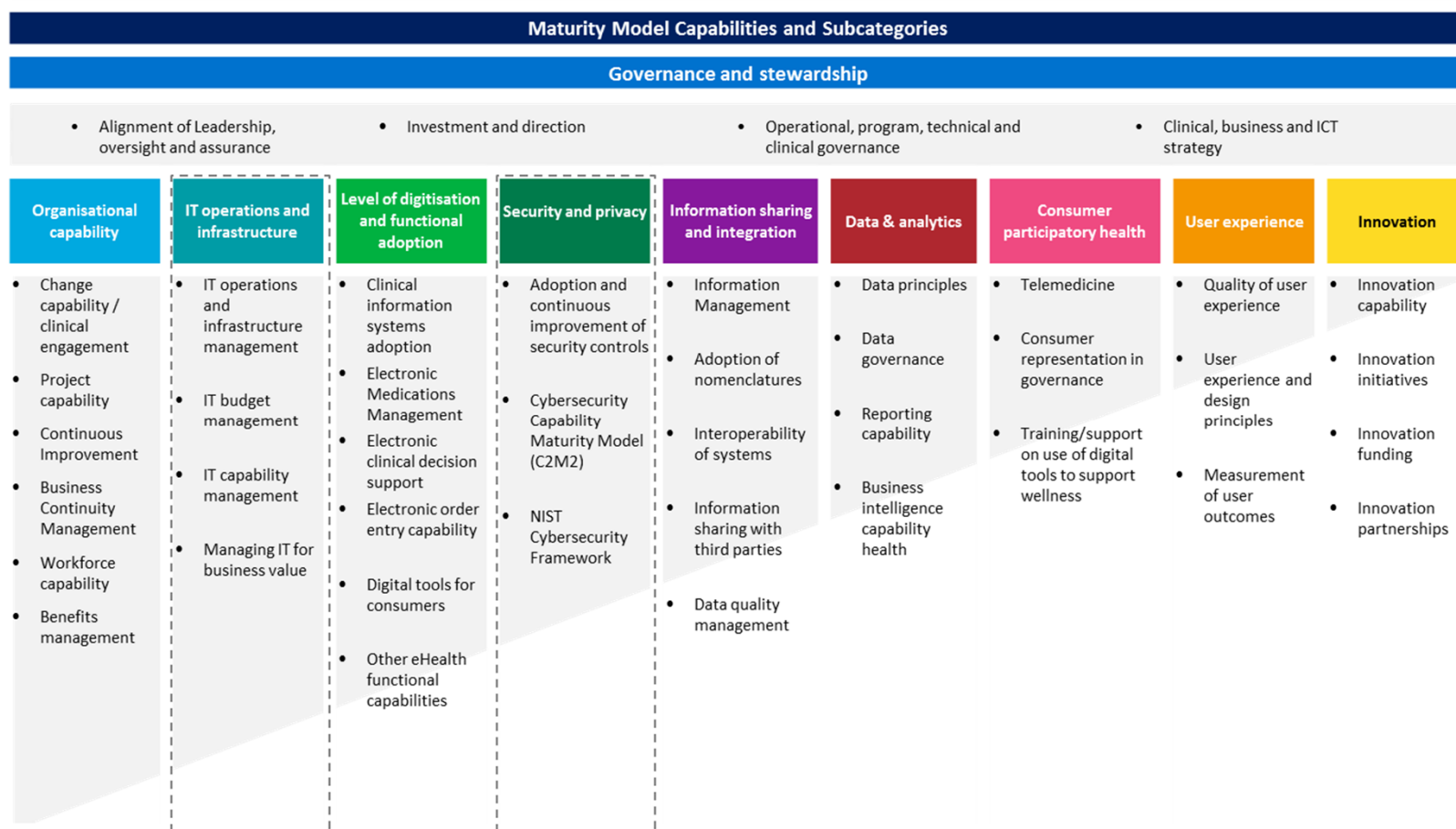**Problem:** "The department's investment decisions have not been informed by a comprehensive understanding of clinical ICT maturity or an inventory of key ICT assets in the sector. As a result, there is limited assurance that scarce government funding has been directed to address the most critical health ICT needs or has been appropriately distributed."

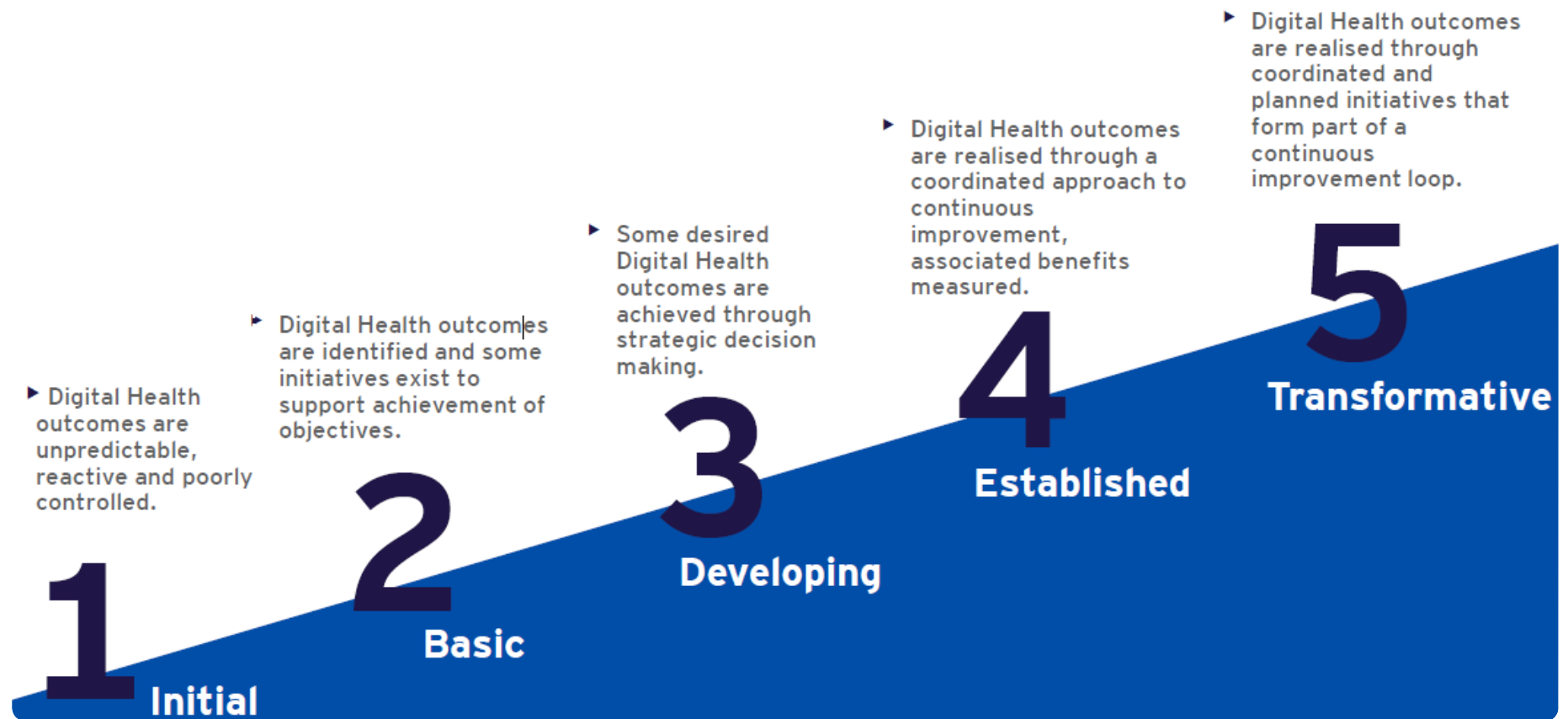**ICT Strategic Planning in the Health Sector 2017 VAGO**

Digital maturity model

The Victorian Digital Health Maturity Model is built on 10 capabilities, which are ordered to identify core digital health organisational capabilities as well as digitisation within a health service.

Maturity Model Capabilities and Subcategories									
Governance and stewardship									
• Alignment of Leadership, oversight and assurance		• Investment and direction		• Operational, program, technical and clinical governance			• Clinical, business and ICT strategy		
Organisational capability	**IT operations and infrastructure**	**Level of digitisation and functional adoption**	**Security and privacy**	**Information sharing and integration**	**Data & analytics**	**Consumer participatory health**	**User experience**	**Innovation**	
• Change capability / clinical engagement	• IT operations and infrastructure management	• Clinical information systems adoption	• Adoption and continuous improvement of security controls	• Information Management	• Data principles	• Telemedicine	• Quality of user experience	• Innovation capability	
• Project capability	• IT budget management	• Electronic Medications Management	• Cybersecurity Capability Maturity Model (C2M2)	• Adoption of nomenclatures	• Data governance	• Consumer representation in governance	• User experience and design principles	• Innovation initiatives	
• Continuous Improvement	• IT capability management	• Electronic clinical decision support	• NIST Cybersecurity Framework	• Interoperability of systems	• Reporting capability	• Training/support on use of digital tools to support wellness	• Measurement of user outcomes	• Innovation funding	
• Business Continuity Management	• Managing IT for business value	• Electronic order entry capability		• Information sharing with third parties	• Business intelligence capability health			• Innovation partnerships	
• Workforce capability		• Digital tools for consumers		• Data quality management					
• Benefits management		• Other eHealth functional capabilities							

Digital Health outcomes are unpredictable, reactive and poorly controlled.

Digital Health outcomes are identified and some initiatives exist to support achievement of objectives.

Some desired Digital Health outcomes are achieved through strategic decision making.

Digital Health outcomes are realised through a coordinated approach to continuous improvement, associated benefits measured.

Digital Health outcomes are realised through coordinated and planned initiatives that form part of a continuous improvement loop.

1 Initial

2 Basic

3 Developing

4 Established

5 Transformative

Digital Health Roadmap

Program of Work 1: Healthcare information managed on systems that are reliable and resilient

Program of Work 1 ensures reliable and resilient digital systems are available to support clinicians providing patient healthcare. When these systems are not available, patient safety is at risk. There are seven initiatives under this program of work.

Initiatives	Benefits of implementation
1. Improve Ability and Resilience 2. Clinical Grade Network 3. Disaster Recovery as a Service 4. Microsoft Legacy Risk Mitigation 5. Cybersecurity 6. Asset Lifecycle Management Hardware Infrastructure 7. Asset Lifecycle Management Applications Infrastructure	• Care is delivered across Victoria 24/7 supported by communication, networks and systems with no unplanned outages. • Patient data is private and secure, and cyber vigilance is actively maintained and strengthened. • Clinical systems are supported and responsive, including complex imaging, telehealth, portals, and administrative systems. • Systems operate with high availability, and failover and disaster recovery can be enacted quickly.

Alignment with Victorian Digital Health Maturity model	Organisational capability	IT operations and infrastructure	Security and privacy	Governance & stewardship

Program of Work 2: Processes are paper-light, efficient and securely documented to improve the safety, quality and experience of care

Program of Work 2 is digitisation to support safer, more efficient health care, and underpin a joined-up health system. Creating a paper-light public health system in Victoria will improve patient safety, patient experience and the effectiveness of care. There are three initiatives under this program of work.

Initiatives
1. Patient Administration Systems
2. Electronic patient records
3. Digital maturity in public mental health

Benefits of implementation
• Prescribing, test ordering, medicine administration and dispensing, patient histories, care plans, lab results and imaging reports, consultations and treatments are legible, auditable and provided through secure digital systems.
• Clinicians and case managers manage patient care from desktop or portable devices.

Alignment with Victorian Digital Health Maturity model	Level of digitisation and functional adoption	Organisational capability	Governance & stewardship

The dangerous decade

Enrico Coiera,[1] Jos Aarts,[2] Casimir Kulikowski[3]

ABSTRACT

Over the next 10 years, more information and communication technology (ICT) will be deployed in the health system than in its entire previous history. Systems will be larger in scope, more complex, and move from regional to national and supranational scale. Yet we are at roughly the same place the aviation industry was in the 1950s with respect to system safety. Even if ICT harm rates do not increase, increased ICT use will increase the absolute number of ICT related harms. Factors that could diminish ICT harm include adoption of common standards, technology maturity, better system development, testing, implementation and end user training. Factors that will increase harm rates include complexity and heterogeneity of systems and their interfaces, rapid implementation and poor training of users. Mitigating these harms will not be easy, as organizational inertia is likely to generate a hysteresis-like lag, where the paths to increase and decrease harm are not identical.

There is a paradox in the relationship between information and communication technology (ICT) and patient safety. ICT can improve the quality, safety and effectiveness of clinical services and patient outcomes,[1] although the evidence base for this is sometimes weak.[2] As a consequence, the rapid deployment of ICT on a national scale is a priority for many nations faced with a diminishing clinical workforce, increasing workloads, and resource constraints.[3] [4]

However, ICT use can also lead to patient harm.[5] Many commentators have raised concerns that ICT has yet to deliver on its promises,[6] or that the rapid adoption of ICT is a risk.[7] [7a] Errors persist in clinical practice even after ICT is introduced,[8] because manual processes co-exist with the automated, and the interfaces between the two are seldom perfect. Others counter that such overemphasis on ICT-related harm only delays the implementation of a crucial technology that will save lives.[9]

It appears that we are caught in a bind. The demands for health system reform are now so compelling that there appears no choice but to implement complex ICT on a large, often national, scale. Yet these ICT systems appear less mature than we would like and our understanding about how to implement and use them safely remains in its infancy. A such, we are faced with a pressing policy challenge on both the national and international stages.[10]

The Institute of Medicine (IOM) of the USA's National Academy of Sciences has now issued a report entitled "Health IT and Patient Safety: Building Safer Systems for Better Care".[11a] It identifies what is known about health ICT safety, and comments on the complex socio-technical context within which these systems are developed and operate. The report makes clear that there is currently

a significant gap in our understanding of the extent and severity of ICT related harm, but that to await more evidence before dealing with the problem is no longer an option. It recommends standards for safety of health IT systems be developed for manufacturers to follow, that a new federal entity be created to specifically monitor and investigatepatient deaths, serious injuries, and unsafe conditions associated with health IT, and to make public its findings. It concludes that the Food and Drug Administration should immediately begin on a framework for regulating health ICT. There is however caution in the report that safety regulations would impede industry innovation, an argument which would literally not fly in the aviation industry. Indeed dissenting views, within the IOM report and without, feel that the time for regulation has now well and truly arrived.[11b] Indeed, calls for regulation of clinical software have been with us for some time now.[11c] [11d] The IOM report is a welcome request both for the resources needed to fill in the gaps in our research evidence about the safety of ICT, but also to put resources into the active detection and management of ICT related harms and near misses. Its caution toward recommending regulation may however be misplaced. Simply put, if healthcare wants the benefits of ICT then it must actively manage its risks.

While basic technical standards for interoperability are now being adopted in many nations, clear standards for user interface design, decision support system construction, or clinician training are only slowly emerging. We are now beginning to appreciate the complex sociotechnical construct that is created when ICT is placed in the hands of users in busy clinical environments.[11] Implementing the same ICT in highly similar organizations can still end up having different results, because of local differences in work or communication patterns.[12] Our understanding of the unintended opportunities for harm that arise when interruptions and multi-tasking disrupt clinicians using information systems is also in its infancy. The psychological literature on interruption is complex, and designing ICT that is 'interruption safe' remains a challenging goal.[13] [14]

If we look to industries in which technical safety is also crucial, history tells us that the journey to creating robust, industrial strength and safe systems is a sometimes perilous one.[15] The aviation industry, often held up as a paragon of safety, developed its safety culture, processes and technology after a very challenging period. Commercial aircraft did crash, lives were lost, and out of catastrophic failures, learning occurred. The learning cycle repeats with every new 'quantum leap' in plane design and the human—machine adaptations that must follow. Technological change always creates new pathways to harm, as evidenced by the sensor malfunctions that led to the Air France airbus catastrophe.
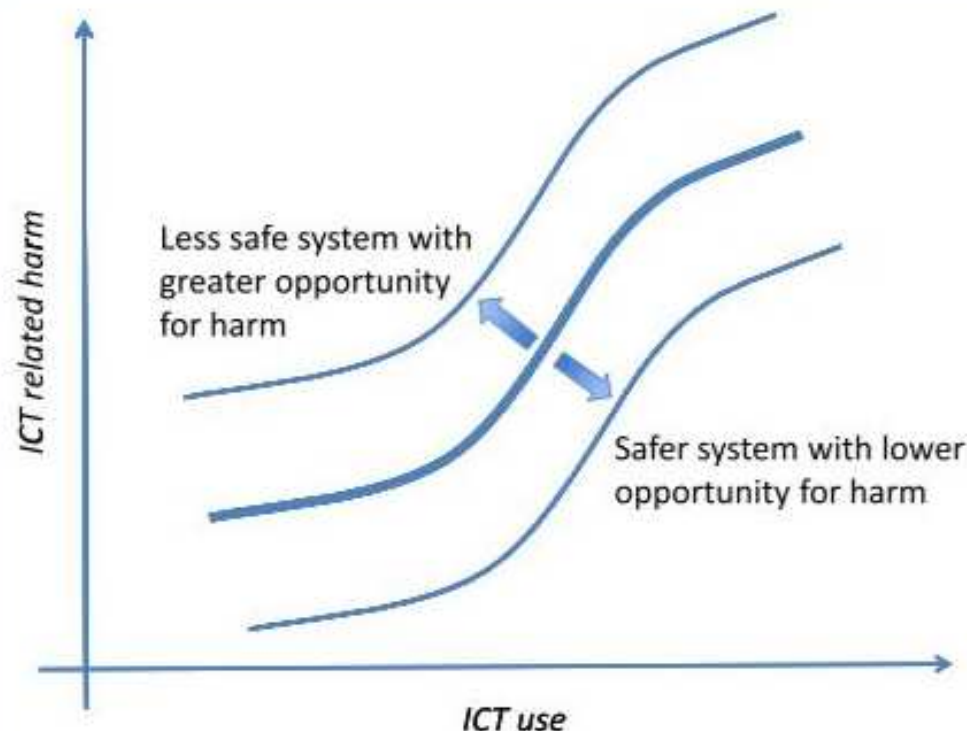

Figure 1 ICT-associated patient harm is likely to increase in step with ICT usage. Different system configurations will have higher or lower opportunities for harm within them, shaping the actual harm rate experienced. ICT, information and communication technology.

Program of Work 3: Continuity of care is securely enabled. Victorians are supported in their journey across settings and providers

Program of Work 3 will create an environment where relevant clinical information is securely shared. This will enable the integration of care, support the provision of safer and higher-quality care and improve patient experience. There are seven initiatives under this program of work.
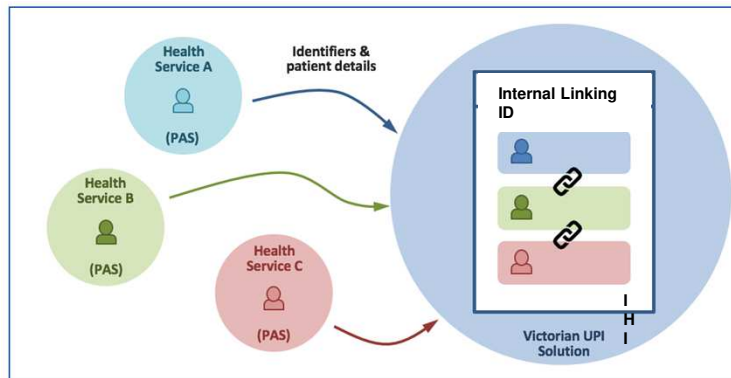
Initiatives	Benefits of implementation
1. My Health Record expansion 2. Unique patient identification 3. eReferral 4. Clinical Information Sharing 5. Statewide image sharing 6. Maternal and Child Health 7. Integration activation for Ambulance Victoria	• Clinicians and case managers can review patient and client treatments, diagnosis information and services provided in different settings and facilities. • Hospital discharge information is securely available to primary care and specialist services. • Ambulatory and community care is managed and viewed by all care teams supporting a patient or client. • Remote monitoring of higher risk patients is offered • Victorian patients are uniquely identified. • Victoria starts the journey toward 'common client'.

Alignment with Victorian Digital Health Maturity model	Information sharing & integration	Level of digitisation and functional adoption	Security and privacy

Joining up Victorian health services
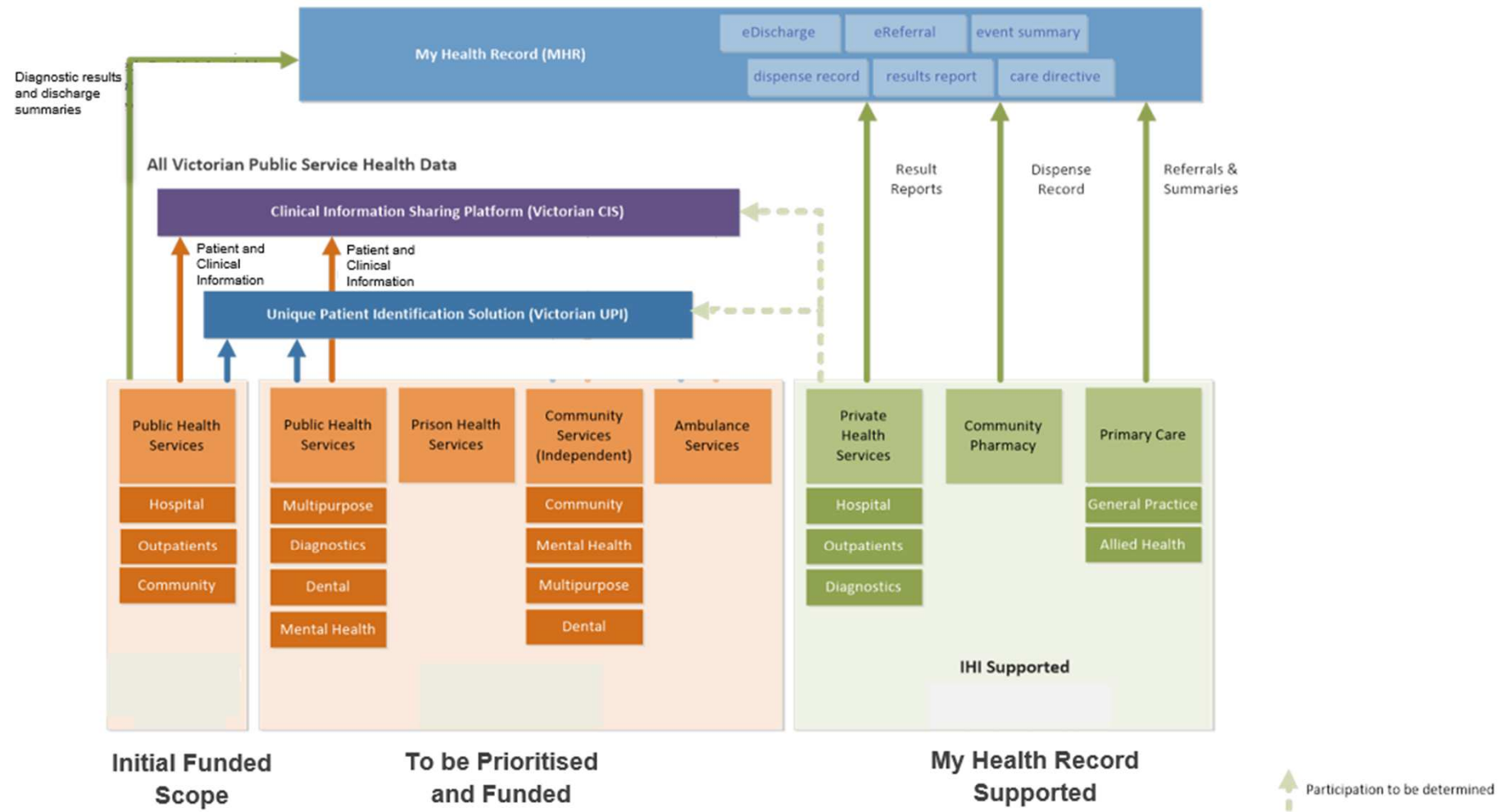
Unique Patient Identification - Victoria

The UPI will link patient identifiers across Victoria. The national Individual Healthcare Identifier (IHI) plays a large role in the matching and linking

Clinically safe thresholds for linking are determined by Health information Managers and clinicians as per current practice to manage duplicates

Health Services manage patient information in Patient Administration Systems as per current practice

Health service data is sent via standard interoperability to the Victorian Unique Patient Identification solution
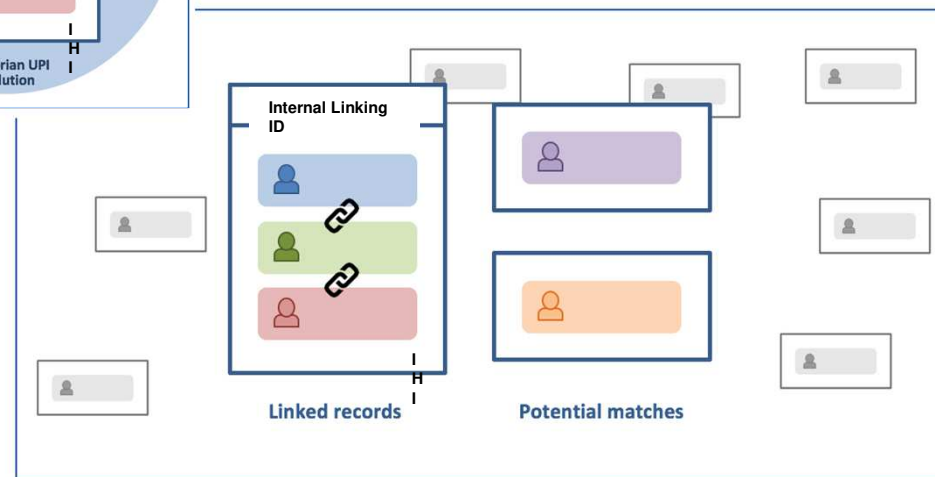
My Health Record Clinical Document types
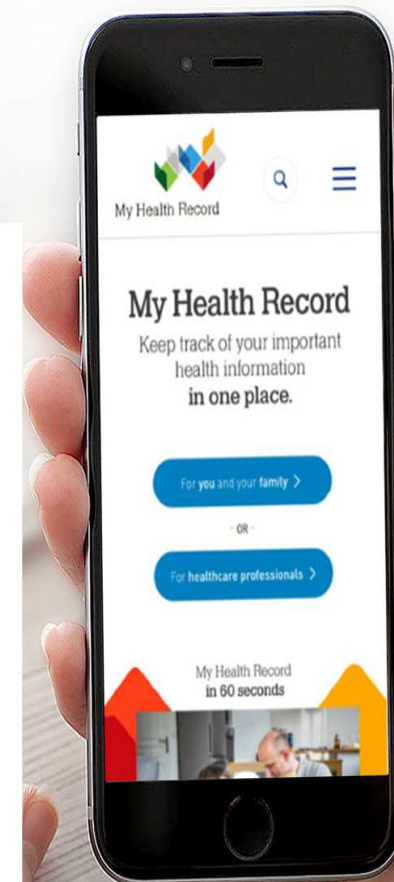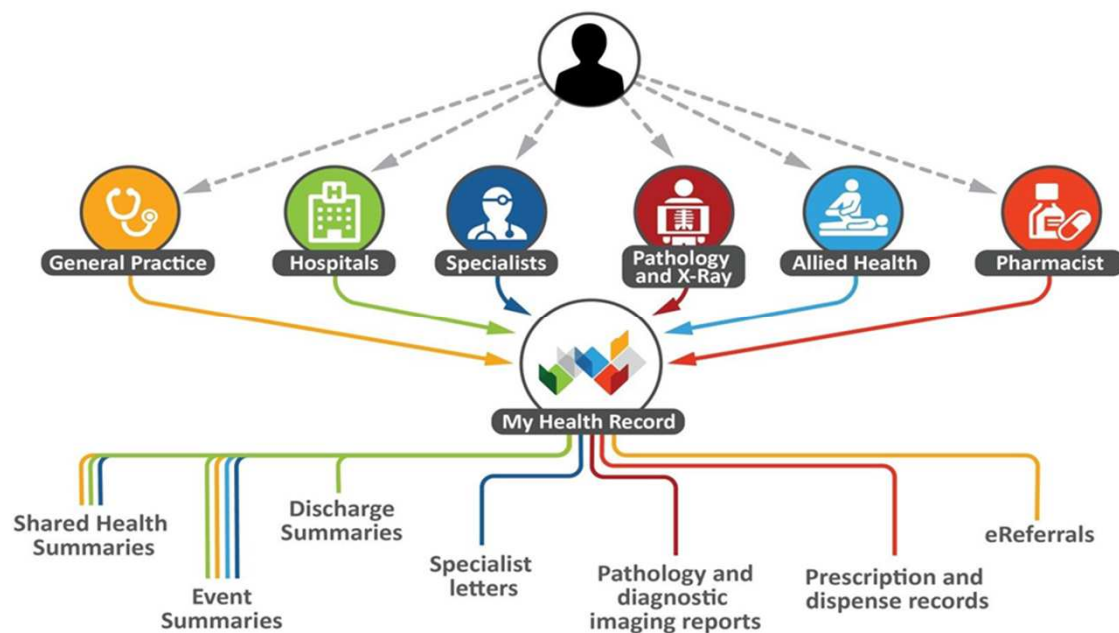
Program of Work 4: Victorians can access information that is meaningful to them

Program of Work 4 will allow consumers, patients and their carers to digitally interact with healthcare providers across a range of activities. This is crucial as patient engagement is correlated to improved patient experience and outcomes. There are four initiatives under this program of work.

Initiatives under consideration	Expected outcomes
1. Statewide patient portal 2. Wayfinding 3. Integrated care navigation 4. Guidance on mHealth	• Victorians' experience of health care is enhanced through access the relevant information • Patients and clients can easily, but securely, access their own health care information. • Victorians and their carers can book appointments, be reminded of impending tests and consultations, and be supported in navigating the healthcare system.

Alignment with Victorian Digital Health Maturity model	Consumer participatory health	Level of digitisation and functional adoption	User experience

Program of Work 5: Advanced use of healthcare data supports early intervention, system management and improves outcomes

Program of Work 5 will see the use of health data to identify individuals who would benefit from intervention to prevent hospitalisation, and the provision of more personalised treatment plans. This will improve the health and wellbeing of Victorians and enhance the sustainability of health care. There are five initiatives under this program of work.

Initiatives	Expected outcomes
1. EARLY DAYS	- Health service providers and planners access a range of real time, near real-time and stratified population views of health status, need, utilisation and demand. - Patient and client outcomes are continually monitored to adapt system responses and improve healthcare access and quality. - Vulnerable Victorians whose health is deteriorating and those at risk of hospital presentation or readmission are identified, and care is provided close to home.

Alignment with Victorian Digital Health Maturity model	Data and analytics	Innovation

Enablers

There are three concurrent, enabling streams of activity

Benefits realisation

Health services will capture and report on the measure of benefits from digitisation cited in business cases. This will enable the quantification of the value generated from investment in digital technologies, and informs future investment proposals and post-implementation activities.

- **Specify and monitor benefits realised**

- **Virtuous cycle to support further investment**

- **Reporting of benefits to support further investment**

Research and Innovation

The future of health care and wellness or Victorians depends on ongoing research and innovation. Research has also been shown to improve the quality of care in healthcare facilities in which research is routinely practised. Both research and innovation are enabled by digitisation of care processes and diagnostic test results.

- **Targeted, sustainable investments**

- **Partnering with Primary Health Networks, Better Care Victoria, Digital Health CRC, CSIRO and health services**

Monitoring and Analytics

Digitisation of care processes, clinical information and health outcomes will provide a robust and efficient platform for the evaluation of health services and of new therapies as well as models of care.

- **Leverage CVDL, VAHI, MS Azure, current data**

- **Improve timeliness to achieve near real time dashboards**

- **Anticipate at patient/client and health provider levels**