



**LEADING DATA REFORM:
THE WAY FORWARD**
OUTCOMES OF THE ACT HEALTH
SYSTEM-WIDE DATA REVIEW

APRIL 2018



ACT
Government
Health

ACKNOWLEDGMENT OF COUNTRY

ACT Health acknowledges the Traditional Custodians of the land, the Ngunnawal people. ACT Health respects their continuing culture and connections to the land and the unique contributions they make to the life of this area. ACT Health also acknowledges and welcomes Aboriginal and Torres Strait Islander peoples who are part of the community we serve.

LETTER TO THE MINISTER

Meegan Fitzharris MLA
Minister for Health and Wellbeing
ACT Legislative Assembly

Dear Minister

I am pleased to submit the report *Leading Data Reform: The Way Forward, Outcomes of the ACT Health System-Wide Data Review*, for your consideration.

On 28 March 2017, you requested ACT Health undertake a comprehensive, System-Wide Data Review including the collection, analysis and reporting of all data in ACT Health. The Terms of Reference of the System-Wide Data Review covered the following:

1. Investigate the extent and where possible, the root cause of the current data issues
2. Establish revised governance processes and protocols for data management, reporting and analysis
3. Develop a framework for the provision of essential data reports derived directly from source systems as an interim process and rebuilding of the ACT data warehouse
4. Implement the framework outcomes
5. Provide a detailed roadmap to address existing recommendations from the Auditor-General and ACT Health external advisors
6. Provide advice on the publication of data for consumers that facilitates improved understanding of ACT Health information, performance, quality and safety, including options for real-time provision of information

The System-Wide Data Review has been a valuable exercise that has identified the key findings, immediate actions undertaken, and future recommendations that will enable the ACT Health reform program. These strong data foundations will drive improvement and step change in the delivery of healthcare that benefit consumers, patients, the health workforce, teaching, training and research functions, and the broader ACT Government.

I acknowledge the contribution, effort and commitment of ACT Health staff, the System-Wide Data Review Panel, and external expert agencies and organisations who have contributed to delivering the System-Wide Data Review.

Yours sincerely



Lynton Norris

Chair, ACT Health System-Wide Data Review Panel
Deputy Director-General
Performance, Reporting and Data Division
ACT Health

6 April 2018

ACKNOWLEDGEMENTS

Shortly after the Terms of Reference were tabled in the ACT Legislative Assembly on 28 March 2017, the ACT Health System-Wide Data Review Panel was established consisting of internal and external stakeholders to provide a balance of oversight and advice on the System-Wide Data Review to the ACT Health Director-General.

ACT HEALTH SYSTEM-WIDE DATA REVIEW PANEL



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Deputy Director-General
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To note: Over the course of the System-Wide Data Review there were changes in panel membership which included: the role of Chair transferred from Peter O'Halloran to Lynton Norris on 29 November 2017; Professor Archie Clements joined the panel on 27 July 2017; from August 2017 Chris Bone transferred from the role of Chief of Clinical Operations to Deputy Director-General, Canberra Hospital and Health Services maintaining the role of Deputy Chair on the Review Panel.

SYSTEM-WIDE DATA REVIEW PROGRAM DIRECTOR



Karen Chudleigh
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EXECUTIVE
SUMMARY

THE SYSTEM-WIDE DATA REVIEW

The System-Wide Data Review is a positive, contemporary piece of work through which ACT Health will strive to improve and contemporise data management for the ACT Health Directorate, now and into the future.

The outcomes of the System-Wide Data Review provide the foundations on which ACT Health's reform programs will rest. It enables intelligence, innovation and leading analytics that will leverage off the full capability of the complex datasets ACT Health holds. It drives ACT Health's vision of best practice performance and quality as well as continuous improvement of patient outcomes including a commitment to quality health services.

The Minister for Health and Wellbeing initiated the System-Wide Data Review in mid-February 2017, at which time ACT Health was unable to provide emergency department, elective surgery waiting times and mental health data for the 2017 Report on Government Services. In addition, there had been a number of external independent data reviews from 2012 to 2016, resulting in 175 recommendations for improved data collection and integrity.

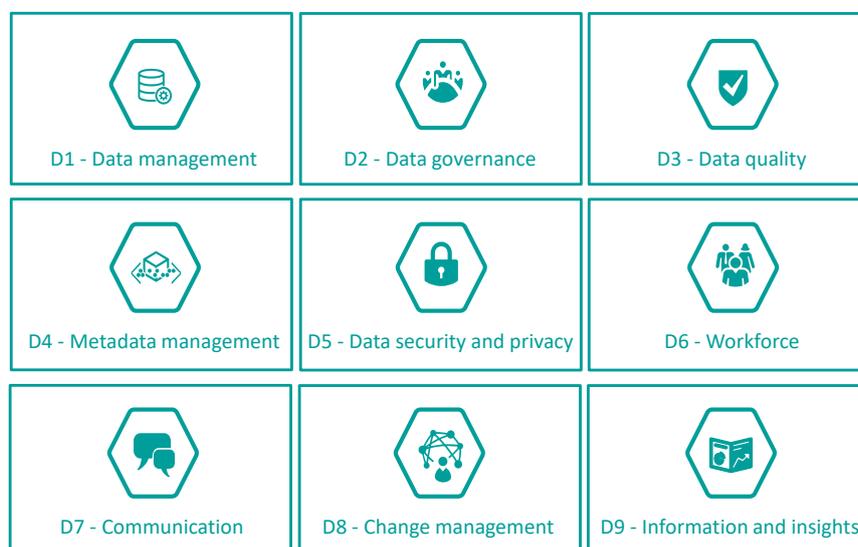
On 28 March 2017, the Terms of Reference for the System-Wide Data Review were tabled in the ACT Legislative Assembly and included the delivery of six Pillars of Work for completion by 31 March 2018. Since that time, ACT Health has been on a journey of reflection, lessons learnt, building capability and capacity, and developing a best practice Performance, Reporting and Data Management Strategy (the Strategy). The Strategy will be an ongoing piece of work which will address root cause and systemic issues, and position ACT Health as a leading health informatics organisation.

ACT Health Performance, Reporting and Data Management Strategic Vision

To provide best practice performance and data management that enables evidence based decision-making to drive system performance and outcomes for the community in line with ACT Health's core values of Care, Collaboration, Excellence and Integrity.

The scope of the Terms of Reference enabled the System-Wide Data Review to identify issues, progress remedial actions and inform longer-term outcomes across ACT Health. Applying industry standards and best practice methodologies, the Terms of Reference were grouped into nine informatics themes, known as 'domains'. The program of work for each domain was developed based on a review and mapping of the 175 external review recommendations, the outcomes and findings of the work to address the Terms of Reference, as well as known issues and best practice data management. There are many key achievements delivered by the System-Wide Data Review, such as meeting external reporting requirements. ACT Health welcomes the opportunity to continue the significant program work which will realise and address the full findings of this comprehensive Review.

The structure of the Outcomes Report is grouped by domains, with the System-Wide Data Review Terms of Reference addressed in each domain, together with the key findings, recommendations, immediate activities, and future activities. The nine domains are:



ADDRESSING THE TERMS OF REFERENCE

Outlined below are the Terms of Reference as tabled in the ACT Legislative Assembly on 28 March 2017. A response has been included to describe the actions taken to address each of the Terms of Reference.

Terms of Reference	Response
1. A summary of the extent, and where possible, the root cause of the current data issues	<ul style="list-style-type: none"> ✓ Completed with 14 key recommendations encompassing strategy, data governance, communication and collaboration, and change management ✓ Activities allocated to each recommendation
2. Establish revised governance processes and protocols for data management, reporting and analysis.	<ul style="list-style-type: none"> ✓ Implemented new data governance processes ✓ Meeting timeframes for reporting obligations ✓ Compliant with national reporting standards ✓ Reviewed all existing reports and prioritised external and internal reports ✓ Developed new change management processes ✓ Improved quality assurance processes ✓ Implemented appropriate access controls ✓ Developed a framework for a new data repository with significant capabilities
3. Develop a Framework for the provision of essential data reports derived directly from source systems as an interim process. This will ensure that ACT Health internal and external reporting requirements can be maintained.	<ul style="list-style-type: none"> ✓ Established a Reporting Coordination Unit for all data requests and releases ✓ Consulted with external and internal stakeholders to develop an essential reports register ✓ Maintained automated operational reports ✓ Embedded compliance activities to meet external reporting obligations ✓ Mapped data definitions against reports ✓ Identified a data repository solution to host definitions and standards ✓ Identified source systems for reporting items ✓ Developed technical specifications for the new data holdings ✓ Developed business requirements for reports
Replacement of the ACT Health data warehouse, reporting and analysis systems and functions.	<ul style="list-style-type: none"> ✓ Collaborated with the ACT Government's Chief Digital Officer to define a new data repository that is consistent with the Whole of Government approach ✓ Designed the data repository to have significant capabilities to provide end to end assurance of the data management lifecycle ✓ Developed, implemented and tested a 'proof of concept' for the emergency department real time waiting times data ✓ Ensured new capabilities support the Territory's Whole of Government Data Lake
4. Implementation of all Framework outcomes	<ul style="list-style-type: none"> ✓ Developed and implemented a range of frameworks to guide development activities
5. Provide a detailed roadmap to address existing recommendations from the Auditor-General and ACT Health external advisers.	<ul style="list-style-type: none"> ✓ Consolidated the 175 external review recommendations into a single report ✓ Reviewed each recommendation for acceptance [or not], prioritisation, and allocated estimated date of completion ✓ Engaged external independent auditor who baselined the status of each recommendation and reviewed quarterly ✓ As at March 2018, 69 recommendations are complete, 70 underway, 15 ongoing and 21 are no longer relevant
6. Provide advice on the publication of data for consumers that facilitates improved understanding of ACT Health information, performance, quality and safety, including options for real-time provision.	<ul style="list-style-type: none"> ✓ Reviewed the current state of information currently published by ACT Health ✓ Reviewed other states and territories and Commonwealth agencies for the quantity and type of data published ✓ Partnering with the Health Care Consumers Association to define a rolling program of work to improve access and understanding of ACT Health data ✓ Developed an ACT Health Measurement Framework consistent with the national performance reporting frameworks ✓ Commenced the Measurement Framework to support the ACT Health Quality Strategy 2018-2028 ✓ Seeking external independent advice regarding best practice leading performance measures ✓ Exploring best practice technical capabilities for consumers to access our data

KEY FINDINGS

The key issues identified during the System-Wide Data Review have been summarised by domain below.

Domain	Key finding
 D1 – Data management	<ul style="list-style-type: none"> • There are over 250 different systems in place across ACT Health that hold patient data. This is a complex environment to collect, store, transform and report consistent information on the 1.5 million episodes of care that ACT Health provides each year • Technologies and best practice data management activities are not embedded, limiting innovation and efficiencies
 D2 – Data governance	<ul style="list-style-type: none"> • Data governance structures, roles and responsibilities, policies, standards and processes are not consistently applied in ACT Health • There was not a single area responsible for the coordination of the 1200 requests for data each year
 D3 – Data quality	<ul style="list-style-type: none"> • Data definitions used in ACT Health were not always consistent across the organisation or with national standards • The impact of poor or inaccurate data entry was not fully understood by certain users • Data quality practices were not fully embedded across ACT Health, or the data lifecycle
 D4 – Metadata management	<ul style="list-style-type: none"> • Data dictionaries were not always accessible, resulting in low visibility of data definitions to front line ACT Health data entry staff
 D5 – Data security and privacy	<ul style="list-style-type: none"> • The application of policies and protocols were not well understood across ACT Health • Data repository access rights need to be reviewed so that access is only granted to data repository officers and not all data reporting officers
 D6 – Workforce	<ul style="list-style-type: none"> • There was no formal training program for staff to understand why certain data is collected and the importance of accurate and complete data entry
 D7 – Communication	<ul style="list-style-type: none"> • The benefits of having quality data were not well communicated to ACT Health staff • Changes to data collections were not well communicated • Access to data analysts for advice was not readily available, limiting understanding of data, reporting and performance matters
 D8 – Change management	<ul style="list-style-type: none"> • There was no formal change control process in place to manage new data activities, for example new data items or reports
 D9 – Information and insights	<ul style="list-style-type: none"> • The majority of clinical data provided for operational purposes was not real-time (up to six to eight weeks old) and was not influencing patient outcomes or achieving efficiencies • There was not a consolidated reporting program in place to meet external reporting requirements • Although consumers have access to a large number of public reports, these are not readily accessible in a timely manner, do not directly inform consumer health care choices, or assist with understanding performance, quality and safety of the care provided by ACT Health

KEY RECOMMENDATIONS

The key recommendations made during the System-Wide Data Review have been summarised by domain below.

Domain	Key recommendations	
	D1 – Data management	Build a new data repository, which will collect, store, extract and transform quality data to deliver better insights to the community.
	D2 – Data governance	Embed new governance structures to delineate roles and responsibilities in relation to data across ACT Health, ensuring accountability and transparency is a priority.
	D3 – Data quality	Continually improve the accuracy of data through robust data quality assurance activities.
	D4 – Metadata management	Improve the understanding of how data is defined and how it should be interpreted through the documentation of data definitions, data models and data flows.
	D5 – Data security and privacy	Maintain security and privacy of the data held by ACT Health.
	D6 – Workforce	Continually improve internal workforce capabilities around data to build a strong data and analytics team, and train the health workforce to leverage the use of data for decision-making.
	D7 - Communication	Improve communication about data across ACT Health, mobilising a cultural shift around data management, with the intent of creating a new relationship between data, the community and stakeholders.
	D8 – Change management	Embed change management practices as business needs evolve and ensure these enhancements are appropriately governed.
	D9 – Information and insights	Be transparent within and outside ACT Health, by meeting regulatory requirements as well as deliver insights and intelligence about the healthcare services delivered throughout ACT.

KEY ACHIEVEMENTS

ACT Health is on a course that will support innovation in data management and reporting to meet local community, territory wide and national requirements. Some of the key outcomes achieved are outlined below.

 <p>Data security and privacy</p> <p>Embedded new access control processes and reviewed policies and processes that protect our data.</p>	 <p>Communication</p> <p>Developed a new communication strategy to better inform stakeholders of what we do and how we will work with them moving forward.</p>	
 <p>Data management</p> <p>Developing a new data repository that will provide significant capability to collect, store and deliver information to stakeholders.</p>	 <p>Information and insights</p> <p>Current consumer reporting has been assessed and benchmarked against other states and territories. Working with the Health Care Consumers Association to define their requirements.</p>	
 <p>Data quality</p> <p>An improved quality assurance process is conducted prior to the release of information from ACT Health.</p>	 <p>Change management</p> <p>Adapting to the changing needs of stakeholders by introducing a change control board and new processes to oversee the release of new reports and changes to data specifications.</p>	
 <p>Data governance</p> <p>New governance structures and committees are being embedded to steward data and reporting.</p>	 <p>Information and insights</p> <p>Meeting external reporting obligations. We have a live register in place to prioritise internal and external reports.</p>	 <p>Data quality</p> <p>Reviewed the application of national costing standards resulting in a significant improvement in the quality of costing data.</p>
 <p>Metadata management</p> <p>In principle agreement with the Australian Institute of Health and Welfare to utilise their online metadata registry as a data repository for all definitions and standards ensuring consistency across facilities and compliance with national standards.</p>	 <p>Workforce</p> <p>The Performance, Reporting and Data Management plan has been developed. The current workforce has been baselined and will be regularly reviewed to ensure the right balance of capabilities is available.</p>	
 <p>Root Cause Analysis</p> <p>An external independent Root Cause Analysis has identified systemic issues to be addressed and provided a plan to address them.</p>	 <p>Data governance</p> <p>A Reporting Coordination Unit has been established to coordinate data releases and requests.</p>	



OVERVIEW

OVERVIEW OF THE SYSTEM-WIDE DATA REVIEW

The System-Wide Data Review has been instrumental in resetting and enabling effective data management practices across ACT Health, bringing a definitive Performance, Reporting and Data Management Strategy that will transition ACT Health to a best practice data and reporting agency.

Approach to the System-Wide Data Review

The immediate response to the Terms of Reference included establishing a Review Panel (nominated and approved by the Minister for Health and Wellbeing), who have collectively provided expert advice to inform the program of activities. Simultaneously, an internal executive committee was established to take ownership and support the direction needed to drive change.

Supporting 'A Healthier Canberra' – ACT Health broader strategic plans

Almost all areas of ACT Health are impacted by the increasing complexity and quantum of data. The need for innovative and transparent data management and reporting to meet community, territory-wide, and national requirements is essential. The System-Wide Data Review has been instrumental in resetting and enabling effective data practices across ACT Health that will drive new system insights and improvement in health outcomes. Leading data reform initiatives, together with the Digital Health Strategy will support and align the broader ACT Health strategic plans, including:

- The Draft Territory-Wide Services Framework 2017-2027 which sets out the overarching principles for integrating patient-centred care to improve the health outcomes of Canberrans
- The ACT Health Quality Strategy 2018-2028 which provides a framework through which improvement in services offered to consumers can be focused and measured.

As healthcare in the ACT is transformed over the next decade to new models of care; data and information also needs to evolve. Agility is required to support these new health directions and provide fit-for-purpose digitally-enabled data and insights into their effectiveness in delivering improved, patient centred and coordinated care.

In supporting the vision for 'A Healthier Canberra' ACT Health is committed to:

Putting patients at the centre of everything we do.

Success going forward will be measured by health outcome improvements enabled and delivered for

patients. Using the insights gained from best practice data management, to empower patients and clinicians to receive and provide safe, effective and timely care from an efficient and transparent health system.

Enabling continuous improvement and innovation.

Best practice data management will enable information to be gathered, shared and outcomes tracked. The ACT Health Performance, Reporting and Data Management Strategy supports the health workforce to continually improve their practice through providing access to user-friendly analytics tools and technologies supporting evidence based decision-making.

Improving the availability of health information.

ACT Health is working towards delivering a new regime of performance reports, which will provide confidence to the Community that our work is transparent by publishing informative measures to hold ACT Health to account. There are three key external reports that are informing this work and external advice has been sought to develop leading best practice performance metrics.

The external reports are:

1. The 2018 Auditor-General's Report - the ACT Governments Strategic and Accountability indicators
2. The 2017 Auditor-General's Report Mental Health Services – Transition from Acute Care
3. The 2017 Standing Committee on Health, Ageing and Community Services Annual and Financial Reports 2015-2016.

Developing partnerships and engaging subject matter expertise.

ACT Health will continue to work in collaboration with other government agencies, non-government health providers, and subject matter experts to build and deliver world-class performance, reporting and data management capabilities.

To date, ACT Health has engaged independent experts from PwC, Deloitte and Synergy Group Australia to review and assist in the development of the System-Wide Data Review program of activities ensuring the activities are comprehensive and overtime will address all systemic issues.

WHAT WILL THE FUTURE LOOK LIKE FOR CANBERRANS?

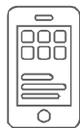
ACT Health's vision is to transform healthcare outcomes through data, new knowledge and enhanced technology. Health consumers, health professionals, researchers and the broader health system will benefit from the delivery of the Performance, Reporting and Data Management Strategy.

BENEFITS FOR CONSUMERS

ACT Health wants all health consumers to be able to access information that helps them be in control and involved in their own care

Example 1. Access to real time information using new digital technologies

Emily has dislocated her shoulder and requires immediate care.



Emily's mum uses technology (such as a mobile phone application) to look up ED waiting times.

Upon consultation at the ED, they are advised Emily will require surgery. So using the same technology, they look up the estimated waiting times for the procedure, and information on Emily's prior visits to the ED.



The family is able to use this to inform their discussions with their local GP and other health care providers to plan Emily's treatment and recovery.



BENEFITS FOR THE HEALTH WORKFORCE

ACT Health wants our workforce to be highly informed and enabled to continuously improve patient outcomes through timely access to data and information

Example 2. Access to real time data across a patient's pathway and history

Mitchell is a nurse triaging at the ED. An elderly woman presents with a leg wound surrounded by broken skin.



Mitchell uses the online system to access history and identifies that the patient has had three surgeries in the last 12 months for a hip replacement and has also recently been to a Walk-in Centre for her leg wound, which is not healing.

Through quickly reviewing the patient's history online, Mitchell suspects there may be a more serious underlying cause than the surface wound. He triages the elderly woman for a Doppler ultrasound urgently.



The ultrasound reveals the elderly woman has an underlying blood clot that is beginning to form into a venous leg ulcer wound.

The elderly woman receives treatment for the blood clot as well as the wound on her leg.



The access to data across the patient's pathway as well as the patient's medical history at multiple health facilities ensures Mitchell is able to triage quickly and appropriately, improving the patient's long-term outcomes.

BENEFITS TO THE ACT HEALTH SYSTEM

ACT Health wants the health system to function at its best through transparency on the quantity and quality of health services required and provided to the community

Example 3. Access to predictive modelling tools

Through predictive modelling, ACT Health is able to use risk stratification to identify health trends in our community that are most likely to be affected by chronic conditions.

Collaborating with the Australian Institute of Health and Welfare on national data linkages, enables ACT Health to gain insights into preventative measures to manage these chronic conditions.

Resources can be directed to at risk consumers, supporting their effective care, as well as other health prevention programs that target high-risk communities.



This not only improves the health outcomes of the community, but also reduces strain on the healthcare system.

BENEFITS TO TEACHING, TRAINING AND RESEARCH

ACT Health wants to ensure there is better access to data and information that supports teaching, training and research

Example 4. Access to health data

Emma is an academic and clinician investigating higher readmission rates for elderly patients over the last year.



Using ACT Health data, she is able to identify that the spike is due to particularly high readmissions for patients coming from a specific nursing home.

Using information relating to the diagnoses of these patients, as well as their pathology results, Emma is able to identify a pattern, which indicates the spread of a multi-drug resistant respiratory infection in the nursing home.



Emma's research helps the health system to contain the spread of this infection and develop alternate treatment plans for the patients effected.

KEY FINDINGS, IMMEDIATE ACTIONS AND FUTURE ACTIVITIES

Domain	Page #	Key findings	SWR TOR	Recommendation
 <p>D1 - Data management</p> <p>The design and architecture of systems and processes, which collect, store and prepare data for analysis and reporting.</p>	Page 27	<p>The external reviews highlighted inconsistencies in some datasets as a result of minimal documentation of the data extraction, transformation and loading processes.</p>	2.1 3.1 3.2 6.0	Build a new data repository, which will collect, store, extract and transform quality data to deliver better insights to the community.
 <p>D2 – Data governance</p> <p>The structures and rules in place to provide direction, oversight and accountability to the use of data and the reporting of information.</p>	Page 31	<p>There was an understanding of roles and responsibilities relating to data management within ACT Health, however this was not well documented or communicated to external stakeholders.</p> <p>Further it was identified that a Data Management and Governance Framework should be developed, including formalising staff roles and responsibilities with regards to data. Improved processes should also be implemented to coordinate the significant number of data requests and to ensure that data was released using a consistent and controlled process.</p>	2.3	Embed new governance structures to delineate roles and responsibilities in relation to data across ACT Health, ensuring accountability and transparency is a priority.
 <p>D3 – Data quality</p> <p>The accuracy, reliability, validity and timeliness of data.</p>	Page 34	<p>There had been significant improvement in the data validation processes for all data released from ACT Health, however, improvements were required to ensure the appropriateness and effectiveness of the processes.</p> <p>In addition, the external reviews noted that ACT Health should strive for a robust Data Quality Strategy to ensure all elements of best practice data management could be embedded over time.</p>	2.4	Continually improve the accuracy of data through robust data quality assurance activities.

Program of activities	Key immediate actions	Future activities
D1.1 Data submission specifications	<ul style="list-style-type: none"> Developed specifications for data submission to meet external reporting requirements 	<ul style="list-style-type: none"> Align data repository with local and national submission specifications
D1.2 Data repository process	<ul style="list-style-type: none"> Developed data repository process monitoring report 	
D1.3 New data repository business case	<ul style="list-style-type: none"> Obtained approval for a new data repository by developing a business case Commenced development of a new data repository with well documented and validated processes 	<ul style="list-style-type: none"> Build the new data repository
D1.4 Data Management Strategy		<ul style="list-style-type: none"> Embed a Data Management Strategy
D1.5 Upgrade/reduce the number of data collection systems		<ul style="list-style-type: none"> Upgrade/reduce the number of data collection systems across ACT Health
D2.1 Data governance roles and responsibilities matrix	<ul style="list-style-type: none"> Developed and embedded data governance roles and responsibilities 	
D2.2 Governance committees identified	<ul style="list-style-type: none"> Established executive level leadership for data governance Identified appropriate data governance committees 	<ul style="list-style-type: none"> Continuous oversight and review from governance committees
D2.3 Establish Reporting Coordination Unit	<ul style="list-style-type: none"> Established the Reporting Coordination Unit to provide a centralised point of data release, requests and help desk functionality 	
D2.4 Root Cause Analysis	<ul style="list-style-type: none"> Commissioned an external independent Root Cause Analysis 	<ul style="list-style-type: none"> Action findings and recommendations of the Root Cause Analysis
D2.5 Data Management and Governance Framework	<ul style="list-style-type: none"> Developed data management frameworks, policies and processes 	<ul style="list-style-type: none"> Finalise and embed the Data Management and Governance Framework Finalise and embed data custodian and ownership policies
D2.6 Data management plans for all service areas	<ul style="list-style-type: none"> Commenced pilots to embed data management plans across business units in ACT Health 	<ul style="list-style-type: none"> Rollout data management plans for all business units
D3.1 Quality assurance and clearance steps	<ul style="list-style-type: none"> Reviewed and updated the formal quality assurance process 	
D3.2 End of year business processes	<ul style="list-style-type: none"> Established end of year business processes to validate data 	
D3.3 Data Validation Strategy		<ul style="list-style-type: none"> Embed a Data Validation Strategy to ensure transparency
D3.4 Develop audit program across source systems		<ul style="list-style-type: none"> Develop an audit program across source systems
D3.5 Audit program - baseline assessment		<ul style="list-style-type: none"> Undertake a baseline assessment of data quality through an audit program of the system
D3.6 Clinical Coding Strategy	<ul style="list-style-type: none"> Developing a Clinical Coding Strategy 	<ul style="list-style-type: none"> Embed the Clinical Coding Strategy
D3.7 Gap analysis of data collection		<ul style="list-style-type: none"> Undertake a gap analysis of data collections
D3.8 Data Quality Framework and Strategy	<ul style="list-style-type: none"> Commenced development of a Data Quality and Strategy Framework in line with the ACT Government Office of the Chief Digital Officer 	<ul style="list-style-type: none"> Finalise and embed the Data Quality Framework and Strategy
D3.9 Data quality statements for priority datasets		<ul style="list-style-type: none"> Develop data quality statements for priority datasets
D3.10 Data Management Group	<ul style="list-style-type: none"> Established the Data Management Group and associated Terms of Reference 	
D3.11 Data resubmission		<ul style="list-style-type: none"> Undertake data resubmissions

Domain	Page #	Key findings	SWR TOR	Recommendation
 <p>D4 – Metadata management Documenting data so that there is a common understanding of how it is defined.</p>	Page 37	<p>ACT Health had undertaken significant work with regards to metadata such as definitions, but this was not readily accessible to all staff.</p> <p>In addition, it was identified that when new data fields were introduced, there was poor visibility and communication which resulted in a poor understanding of the metadata requirements.</p>	3.3	Improve the understanding of how data is defined and how it should be interpreted through the documentation of data definitions, data models and data flows.
 <p>D5– Data security and privacy The secure storage and access to information.</p>	Page 20	<p>Policies and protocols for data access and security were evident across ACT Health however, the impact of their application was not clearly understood by all staff.</p> <p>Further there was a need to review access rights to the raw data to ensure that this data could only be accessed by appropriately accredited staff.</p>	2.5	Maintain security and privacy of the data held by ACT Health.
 <p>D6 - Workforce Organising teams working with data and enabling successful data management practices through training and communication.</p>	Page 30	<p>There are pockets of data and analytics expertise across ACT Health but the understanding of the importance of data quality needs to be increased given the importance of having complete and accurate datasets which inform national reform activities such as Activity Based Funding.</p> <p>Therefore, it was found that ACT Health would benefit from developing a data training program for all staff to improve their understanding of why data is collected, the importance of quality data entry, and how it should be used, reported and interpreted.</p>	N/A	Continually improve internal workforce capabilities around data to build a strong data and analytics team, and train the health workforce to leverage the use of data for decision-making.
 <p>D7 - Communication Channels through which staff can get information and assistance.</p>	Page 32	<p>There was a clear need to better communicate changes across ACT Health regarding the requirement for new data items and collections. It was also identified that staff required mechanisms to access advice from data analysts for assistance in dealing with data queries.</p>	N/A	Improve communication about data across ACT Health, mobilising a cultural shift around data management, with the intent of creating a new relationship between data, the community and stakeholders.

Program of activities	Key immediate actions	Future activities
D4.1 Mapping of reports to source systems	<ul style="list-style-type: none"> Undertook a mapping exercise of reports to data items of source systems 	
D4.2 Memorandum of Understanding with the Australian Institute of Health and Welfare for data and metric definitions	<ul style="list-style-type: none"> Developing a Memorandum of Understanding to use the Australian Institute of Health and Welfare online data repository for data and metric definitions 	
D4.3 Australian Institute of Health and Welfare metadata registry		<ul style="list-style-type: none"> Ongoing development and rollout of the Australian Institute of Health and Welfare data definitions
D4.4 Metadata model		<ul style="list-style-type: none"> Develop a metadata model
D5.1 Security and access policies	<ul style="list-style-type: none"> Reviewed and amended data access rights through audits Revised data access policies and protocols 	<ul style="list-style-type: none"> Build the new data repository and embed data access protocols Undertake rolling data access audits
D5.2 Develop training package for security and access		<ul style="list-style-type: none"> Develop and rollout staff training package for security and access Conduct ongoing staff training relating to data security and privacy
D5.3 Perform an assessment of the ACT Government Protective Security Policy Framework to ensure compliance		<ul style="list-style-type: none"> Perform an assessment of the ACT Government Protective Security Policy Framework to ensure compliance
D6.1 Baseline and recruitment of internal data management workforce	<ul style="list-style-type: none"> Undertaken baseline assessment of internal data management workforce 	
D6.2 Performance, Reporting and Data Management Strategy	<ul style="list-style-type: none"> Developed a high level strategic plan for the Performance, Reporting and Data function 	<ul style="list-style-type: none"> Embed and implement the strategic plan
D6.3 Staff performance plans	<ul style="list-style-type: none"> Developed processes and communication to have staff performance plans in place 	<ul style="list-style-type: none"> Ensure that all staff continue to have performance plans in place
D6.4 Performance, Reporting and Data training and orientation package	<ul style="list-style-type: none"> Developed orientation training packages for Performance, Reporting and Data staff 	<ul style="list-style-type: none"> Further develop the Performance, Reporting and Data function training packages
D6.5 Benchmark internal workforce requirements		<ul style="list-style-type: none"> Benchmark internal workforce requirements
D6.6 ACT Health data management training package	<ul style="list-style-type: none"> Completion of a training package for the Emergency Department Information System made mandatory prior to system access 	<ul style="list-style-type: none"> Develop ACT Health data management training packages
D6.7 Gap analysis of data management workforce		<ul style="list-style-type: none"> Perform a gap analysis of the data management workforce
D7.1 Communications Strategy	<ul style="list-style-type: none"> Drafted a Communications Strategy and Stakeholder Engagement Plan 	<ul style="list-style-type: none"> Roll out the Communications Strategy and Stakeholder Engagement Plan Develop and distribute regular communications
D7.2 Develop processes to generate queries log within the Reporting Coordination Unit	<ul style="list-style-type: none"> Established a help desk to assist staff Developed processes to generate a queries log within the Reporting Coordination Unit 	
D7.3 Performance, Reporting and Data SharePoint site and intranet portal	<ul style="list-style-type: none"> Designed a SharePoint site and intranet portal 	<ul style="list-style-type: none"> Complete development of the online portals – including SharePoint/intranet site

Domain	Page #	Key findings	SWR TOR	Recommendation
 <p>D8 - Change management Controls to implement data changes.</p>	Page 24	Though there were robust change management processes for existing systems, it was identified that similar processes were also required for new data.	2.2	Embed change management practices as business needs evolve and ensure these enhancements are appropriately governed.
 <p>D9 - Information and insights Range of reporting and analytics capabilities that deliver insights capable of driving strategic and operational decision-making.</p>	Page 34	<p>Whilst there was a significant amount of reporting both internally and externally, there was a clear need to develop a consolidated reporting program in ACT Health, including rebasing and ratifying internal and external requirements with stakeholders.</p> <p>It was also noted that ACT Health would benefit from a number of data and analytics frameworks to meet the requirements of best practice data and performance management.</p> <p>In addition, it was found that there already exists significant public reporting of ACT Health data, however navigation of the multiple systems and websites could be made more user friendly, and more appropriate for the needs of ACT Health consumers.</p>	2.1 3.1 3.2 6.0	Be transparent within and outside ACT Health, by meeting regulatory requirements as well as deliver insights and intelligence about the healthcare services delivered throughout ACT.

Program of activities	Key immediate actions	Future activities
D8.1 Change management processes	<ul style="list-style-type: none"> Developed new policies to formalise change processes 	<ul style="list-style-type: none"> Continue to socialise the change control policies and procedures
D8.2 Change Control Board	<ul style="list-style-type: none"> Established a Change Control Board 	<ul style="list-style-type: none"> Continue to maintain ongoing oversight of change requests via the Change Control Board
D9.1 Register of mandatory reports and schedules	<ul style="list-style-type: none"> Consulted with external stakeholders to produce a schedule/register of mandatory reports to meet reporting obligations Identified essential internal and external reports such that mandatory reporting guidelines are being met more consistently 	
D9.2 ACT Health strategic and national indicators mapping	<ul style="list-style-type: none"> Undertook a mapping exercise of existing ACT Health strategic and national mandatory report indicators 	
D9.3 Identify current state of consumer data	<ul style="list-style-type: none"> Assessed the current state of published consumer data 	
D9.4 Identify options for improved consumer reporting	<ul style="list-style-type: none"> Liaising with the Health Care Consumers Association to define their reporting requirements 	<ul style="list-style-type: none"> Identify options for improved consumer reporting
D9.5 Formalise Costing Framework		<ul style="list-style-type: none"> Revise the Costing Framework
D9.6 Design Activity Based Funding Framework	<ul style="list-style-type: none"> Began reviewing and evolving the existing Activity Based Funding Framework 	<ul style="list-style-type: none"> Design and embed the Activity Based Funding Framework
D9.7 Automated costing and performance metrics		<ul style="list-style-type: none"> Move towards automated costing and performance metrics
D9.8 Measurement Framework to support ACT Health Quality Strategy	<ul style="list-style-type: none"> Commenced drafting the Measurement Framework to support the ACT Health Quality Strategy 	
D9.9 Implement automation of standardised reporting functions		<ul style="list-style-type: none"> Pilot implementation of automated standardised reporting functions
D9.10 Design new performance reports		<ul style="list-style-type: none"> Design new performance reports
D9.11 Design Analytics Strategy and Analytics Framework	<ul style="list-style-type: none"> Commenced developing the Analytics Framework 	<ul style="list-style-type: none"> Design and embed an Analytics Strategy including an Analytics Framework
D9.12 Australian Institute of Health and Welfare data linkage	<ul style="list-style-type: none"> Progressed discussions with the Australian Institute of Health and Welfare to collaborate with national data linkage processes 	<ul style="list-style-type: none"> Establish the linkage of ACT Health data with national processes
D9.13 Pilot, implement and review new performance reporting		<ul style="list-style-type: none"> Pilot, implement and review new performance reporting
D9.14 Recommendations for new local strategic indicators using the Performance Measurement Framework	<ul style="list-style-type: none"> Commenced developing the Performance Measurement Framework 	<ul style="list-style-type: none"> Recommend new local strategic indicators using the Performance Measurement Framework
D9.15 Business Intelligence tool, including Change Management Strategy		<ul style="list-style-type: none"> Select and deploy a Business Intelligence tool and develop and associated Change Management Strategy
D9.16 Continue automation of remaining standardised reporting functions		<ul style="list-style-type: none"> Continue automation of remaining standardised reporting functions
D9.17 Build consumer reporting functionality within the Business Intelligence tool		<ul style="list-style-type: none"> Build functionality within the chosen ACT Health Business Intelligence tool to address the reporting needs of consumers

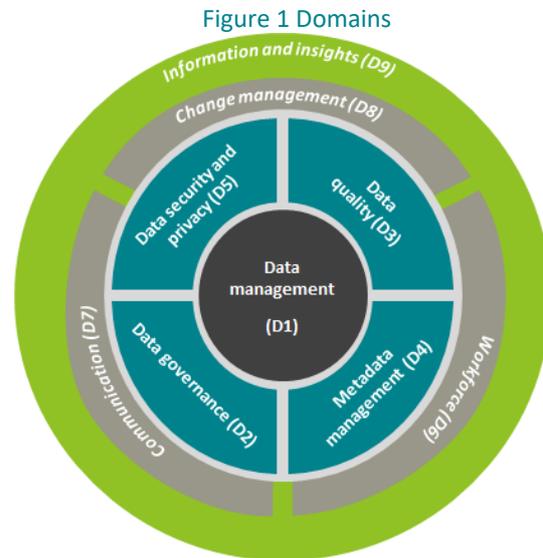
THE FUTURE VISION

Implementing the recommendations from the System-Wide Data Review is not the end of the work. There is still much to be done to ensure ACT Health becomes a leading health agency that provides innovative and transparent data management and reporting to meet community, territory wide and national requirements.

Overview and vision

In the second half of 2017, ACT Health undertook a Mid-Point Assessment of the System-Wide Data Review to consolidate the immediate actions taken, identify related best practice activities and define the future longer-term reforms that would enable ACT health to deliver high quality performance reporting and data to its stakeholders. From this, the ACT Health Performance, Reporting and Data Management Strategy was developed.

The ACT Health Performance, Reporting and Data Management Strategy defines nine domains (as illustrated by Figure 1) to which each of the program activities have been mapped. The domains have been identified through a combination of research on best practice from leading state and territory health agencies and The Data Management Association International (DAMA) Data Management Body of Knowledge (DMBOK).

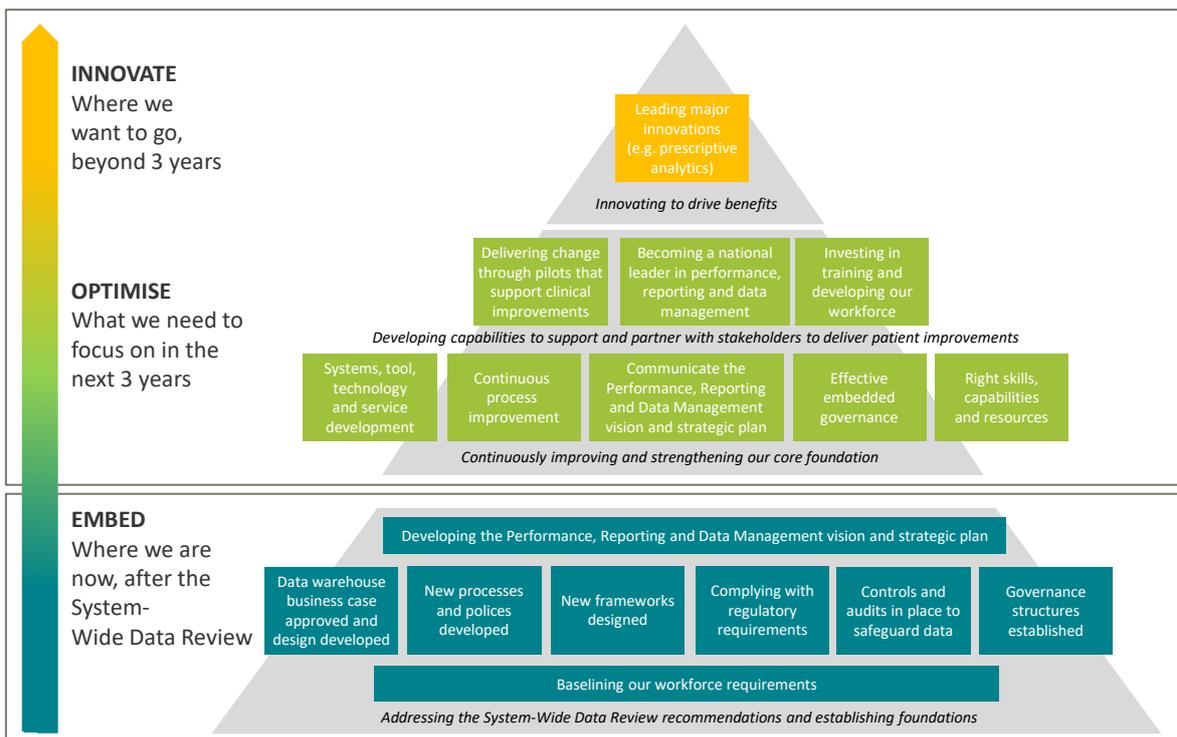


Vision: The vision of the ACT Health Performance, Reporting and Data Management Strategy is to provide best practice performance and data management that enables evidence based decisions to drive system performance and outcomes for the community in line with ACT Health's core values of Care, Collaboration, Excellence and Integrity.

Moving forward

As shown in Figure 2, ACT Health will enhance and build on the foundations established during the System-Wide Data Review towards becoming a leading data health agency. ACT Health will lead data reform and major innovations through using information and insights to support evidence based decision-making. This will drive system performance and support improved outcomes for the community.

Figure 2 Where we are now, after the System-Wide Data Review versus where we want to go beyond three years



A photograph of a woman holding a baby while a healthcare professional shows a tablet to the baby. The woman is looking down at the baby. The healthcare professional is smiling and pointing at the tablet. In the background, there is a cartoon dog on the wall. A green diagonal shape is on the left side of the image.

THE
SYSTEM-WIDE
DATA REVIEW

BACKGROUND

The System-Wide Data Review commenced in February 2017 after ACT Health was unable to provide emergency department, elective surgery waiting times, and mental health data for the 2017 Report on Government Services. Since that time, ACT Health has been on a journey of reflection, lessons learnt and building capability and capacity to embed a best practice data management strategy to address root cause and systemic issues.

ACT Health collects and reports on a range of data metrics associated with providing healthcare services. The outputs are used to inform clinical care, meet internal and external reporting requirements, to fund or receive funding, for legislated reporting, operational decision support and for benchmarking.

A series of issues relating to data management and reporting were identified in 2012 through to 2016, including:

- In 2012, the ACT Auditor-General's Report on Emergency Department Performance Information across Canberra's hospitals highlighted shortcomings in data governance, security and privacy of patient data, and the integrity of the data itself alongside how it was managed¹
- In 2015, the ACT Auditor-General's report on Data Integrity across ACT Health highlighted weaknesses in data management, data governance and data quality
- In 2016, ACT Health did not provide some datasets for a number of national reports such as the 2017 Report on Government Services (RoGS).

From 2012 to 2016, there were six independent reviews of data quality and reporting processes (see Figure 4). These external reviews identified 175 recommendations; covering nine domains (see Figure 3).

Figure 4 Summary of external review reports

External review report name	Report by	Year	# of recommendation's
ACT Auditor-General's Report No. 6/2012: Emergency Department Performance Information	ACT Auditor-General	2012	10
ACT Assembly Standing Committee on Public Accounts: Review of Auditor-General's Report No 6 of 2012: Emergency Department Performance Information	ACT Assembly Standing Committee	2015	16
Reid Review 2012: Review of Information Governance and Performance	Reid	2012	21
Marshall: A Data Integrity Strategy Final Report 2013-2015	Marshall	2013-15	62
Marshall: A Data Integrity Strategy Final Report 2013-2015 (Priority Recommendations)	Marshall	2013-15	5
ACT Auditor-General's Report No. 5/2015: Integrity of Data in the Health Directorate	ACT Auditor-General	2015	20
PricewaterhouseCoopers (PwC) Recommendations 2016	PwC	2016	41
Total recommendations			175

Further detail of each of the 175 recommendations and their status is provided in Appendix 2.

Figure 3 Number of recommendations from external reviews by area from 2012 to 2016, across six external reports



On 14 February 2017, the Minister for Health and Wellbeing announced a comprehensive, System-Wide Data Review to address the ongoing reporting and data issues in ACT Health.

On 28 March 2017, the Minister tabled the Terms of Reference² in the ACT Legislative Assembly, which specified the outcomes expected by 31 March 2018 (see Appendix 1).

CONTEXT

The System-Wide Data Review was a driver for change across ACT Health in relation to data and reporting. However, there are other drivers of change globally, nationally and locally in the ACT that are rapidly changing the role of data and information in healthcare.

The System-Wide Data Review has considered examples of best practice from neighbouring states and territories, and examples from health systems internationally. ACT Health are not the first to encounter data challenges and we have reflected on examples of best practice and started to embed a data culture change that over time, will build a strong foundation for the challenges ahead.

Strategic context

Globally, nationally and locally in the ACT, the role of data and information in healthcare is rapidly changing. The Australian Digital Health Strategy indicates that digital information is the bedrock of high quality healthcare. A data rich and digitally enabled health system can help save and improve lives through avoiding hospital admissions, enabling better coordination of care for people with chronic and complex conditions, ensuring fewer adverse drug events, reducing duplication of tests and contributing to better-informed treatment decisions³.

Organisations and governments within Australia are already demonstrating how they are investing in their healthcare data and information systems as the platform to incorporate innovations and deliver world-class healthcare to their citizens.

The Root Cause Analysis findings identified that ACT Health has a wide and diverse range of data systems (over 240), many of which have their own specific data definitions. There is now opportunity to consider how digital transformation can be used to integrate data and data systems to ultimately improve health outcomes and enable more choice and transparency.

International context

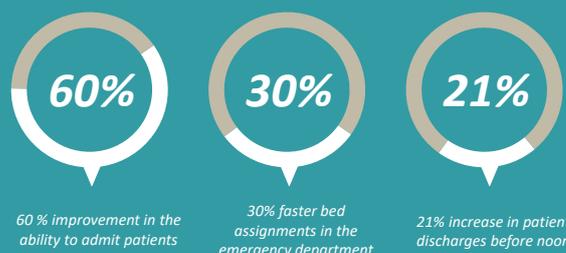
ACT Health is not unique in its level of digital maturity, the Organisation for Economic Co-operation and Development has described many health systems as being at the beginning of a complex journey to encourage the development and safe use of health data⁴. There are many governments and not-for-profit organisations healthcare organisations adopting innovative data and digital strategies and cutting edge analytics. These strategies underpin the efficiency and integrity of their healthcare systems, facilitate data-driven decision-making, and improve the patient experience and outcomes.

Lessons from the United States: John Hopkins Hospital's Judy Reitz Capacity Command Center

The Judy Reitz Capacity Command Center, designed and built with GE Healthcare Partners (GE), combines the latest in systems engineering, predictive analytics and innovative problem-solving to better manage patient safety, experience, volume, and the movement of patients in and out of the hospital, enabling greater access to Johns Hopkins' lifesaving services.

What it does: The system receives about 500 messages per minute from 14 different Johns Hopkins IT systems or modules generating real-time data to trigger action throughout the hospital.

Benefits: By continuously accessing and analysing information flowing in, the staff can prevent or resolve workflow bottlenecks, reduce patient wait time, coordinate services and reduce risk.



Our neighbours

The System-Wide Data Review considered data and reporting initiatives in other states and territories to assess and measure ACT Health data and reporting arrangements.

This work identified the following benchmarks:

- South Australia consumer reporting is mature and is leading the nation in online real time reporting
- New South Wales has robust monthly validation activities
- Victoria has leading performance reporting, supporting guidelines and definitions
- Western Australia has developed quality assurance practices and data strategies, including connectivity, culture and collaboration.

The System-Wide Data Review considered these data and reporting benchmarks in determining and setting the Performance, Reporting and Data Management Strategy.

National reform

Since 2010, there has been significant national health reforms reliant on the ability of states and territories to provide increasingly granular data to national health agencies and the Commonwealth.

Prior to this, states and territories only provided hospital data annually for inpatient hospital classification development and to capture throughput under the previous Australian Healthcare agreements. With the commencement of the National Partnership Agreements, and particularly the National Health Reform Agreement that introduced the Activity Based Funding reforms in 2011, there has been a significant investment by states and territories to build and embed data management and reporting capabilities. There has been a major increase in the complexity and quantum of data required by national health agencies as a result of these reforms. For example, the Independent Hospital Pricing Authority use costing data to develop national efficient costs and prices for the majority of public hospital services, and to develop hospital service classifications. The outputs are used to benchmark performance, bring national consistency, and to inform the calculation of Commonwealth funding to states and territories by the Administrator of the National Health Funding Pool.

ACT Health currently provides patient level data (numerous data items per treatment/procedure) for all in-scope hospital services both inside and outside of the hospital setting such as admitted, non-admitted, rehabilitation and emergency department activity. Each of these datasets require the application of comprehensive standards and definitions. There is also a similar requirement for each patient event to have its service cost and funding calculated. An immediate action under the System-Wide Data Review was to assess the ACT Health's application of the national costing standards. Transparent and robust processes and internal capability development enabled a significant reduction to the previously reported ACT Health patient costs, and brought consistency of measurement with all other states and territories.

Reforms to national healthcare policy will continue to require complex data systems to enable their delivery. For example, in February 2018 the Council of Australian Governments (COAG) Health Council agreed six long-term system wide reform priorities. Each of these reform priorities will be supported by insights drawn from ACT Health and national datasets to either inform policy decisions or monitor implementation success.

The six key reform recommendations are as follows:

1. **Paying for value and outcomes** which includes implementing program and system-level financing reforms within a National Health Financing Framework, with the aim of refining the efficiency and effectiveness of health system funding.
2. **Joint planning and funding at a local level** to drive collaboration, integration, better planning and investment decisions across care settings, with clear accountability for outcomes through quality improvement.
3. **Nationally cohesive health technology assessment** to deliver an efficient and cohesive national approach to health technology assessment and a coordinated approach to investment and disinvestment decision-making.
4. **Empowering people through health literacy** and developing national strategy and action plans for awareness-raising, embedding health literacy and consumer engagement principles in policy development and service delivery
5. **Prevention and wellbeing** by developing a national performance monitoring system, a prevention impact investment fund and health system financing, reporting and accountability arrangements
6. **Enhanced health data** which aims to establish secure and comprehensive arrangements for integrating data across patient journeys to support better planning and decision-making by governments, clinicians, consumers and researchers.

The enhanced health data reform priority is a critical enabler of overall system improvements, and will provide benefit to all the reform priorities as well as all health system consumers and stakeholders.

The specific areas the enhanced health data reform priority is addressing are:

- Developing and improving national datasets
- Identifying national priority analytics projects for evidence-based clinical and health systems policy development and evaluation
- Refining national legislative governance and access frameworks that enable secure, appropriate and timely data access sharing and linkage
- Designing and establishing secure and responsive data and information technology environments

ACT Health will continue to engage with the COAG Health Council through the appropriate forums.

GOVERNANCE

ACT Health’s immediate response to the Terms of Reference included establishing an expert Review Panel, an internal executive committee, and a commitment to conduct independent quarterly audit reviews of the 175 recommendations from external reviews.

The Program of Work commenced shortly after the Terms of Reference were tabled in the ACT Legislative Assembly on 28 March 2017. To ensure there was oversight in place for the System-Wide Data Review, ACT Health’s immediate response to initiate change included:

1. **Establishing an expert Review Panel** – including internal and external stakeholders to provide a balance of advice and oversight of the System-Wide Data Review to the ACT Health Director-General.
2. **Establishing an internal executive committee** (also referred to as a Data Roundtable) – the committee provided internal governance and an additional layer of advice to ensure policy and processes could be considered with pace. The Data Roundtable comprises of the ACT Health

Deputy Directors-General, the Chief Health Officer and the Chief Information Officer. The Director-General is the Chair of the Data Roundtable.

3. **Independent quarterly reviews of the 175 recommendations from external reviews** – to demonstrate that ACT Health has been transparent and accountable with their work.

Figure 5 and Figure 6 below provide a snapshot of the number and proportion of recommendations from the external reviews complete or underway at each of the key milestones.

Over the last year, ACT Health has made significant progress in addressing the 175 recommendations from external reviews, recognising that a number of recommendations are underway and ongoing. The reviews will continue at least bi-annually.

Figure 5 Progress across 175 recommendations from the external reviews

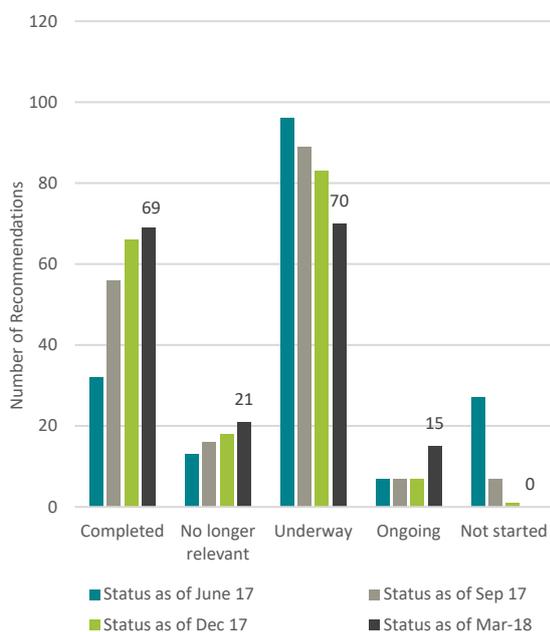
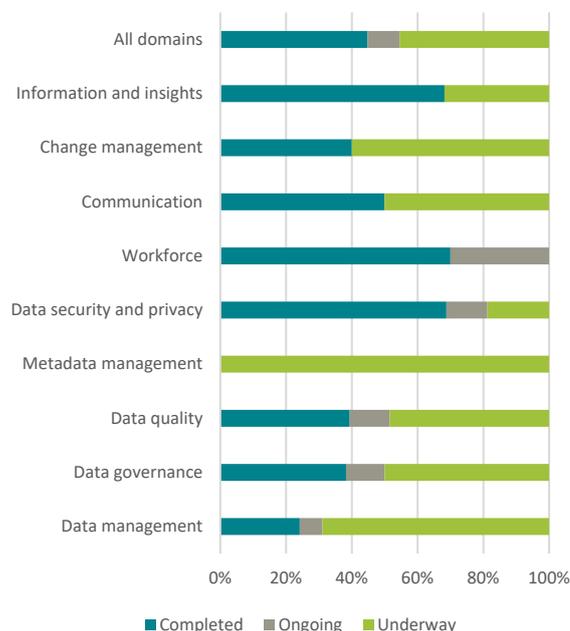


Figure 6 Progress across 154 recommendations from the external reviews at 31 March 2018 by domain



APPROACH

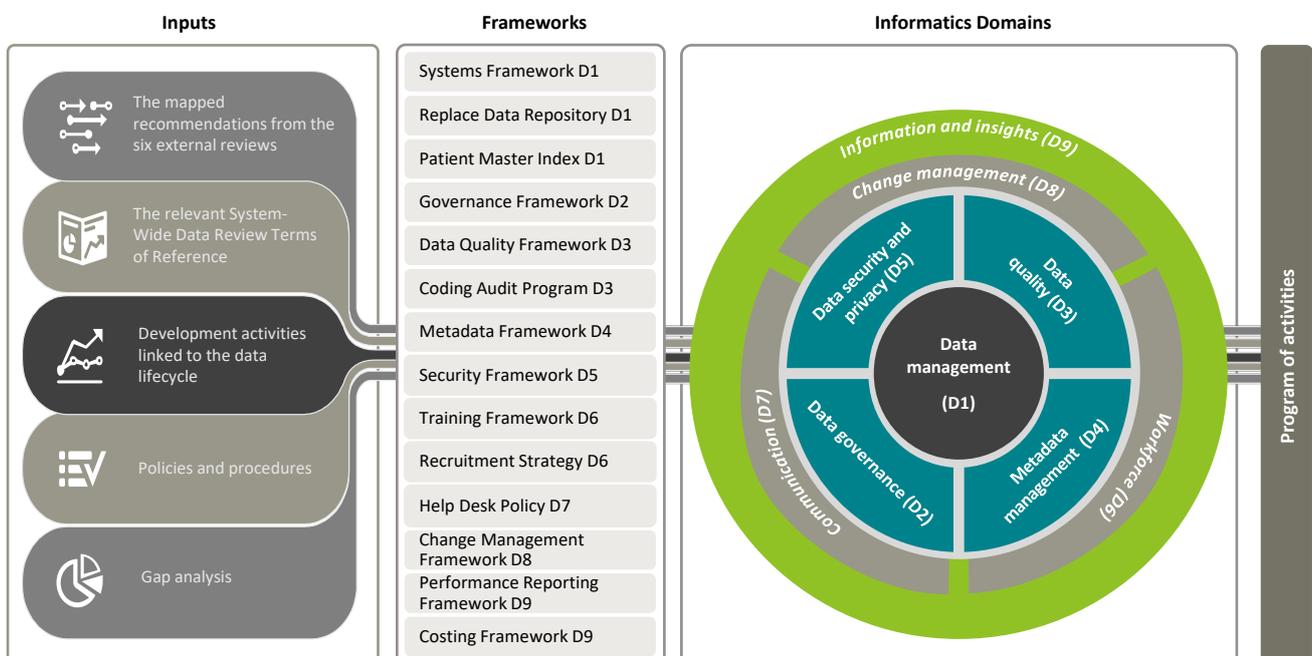
In the early phases of the System-Wide Data Review, there was significant program planning to address the Terms of Reference and the 175 recommendations from the external reviews. The recommendations from the external reviews were assigned across 14 frameworks and nine domains, that once implemented would embed the fundamentals of best practice end-to-end data management.

The overarching approach to develop the program of work for the System-Wide Data Review is outlined in Figure 7 and includes the following four key steps:

1. Identification of all inputs to be addressed under the System-Wide Data Review including: the recommendations from the external reviews, Terms of Reference including a Root Cause Analysis, activities linked to the data lifecycle, current policies and procedures, and a gap analysis of all other areas based on data management best practice research.
2. The application of frameworks against each input. The frameworks defined key elements for consideration when developing robust and quality assured data management practices. The frameworks are described under each of the domains in pages 27 to 51.
3. Based on significant research of best practice activities from leading jurisdictions, the frameworks were mapped to a library of nine domains (D1 – D9) which now form the foundations of the ACT Health Performance, Reporting and Data Management Strategy.
4. Development of a program of activities for each domain that describes the end-to-end solution to addressing the Terms of Reference, the recommendations from the external reviews and additional activities required to move ACT Health towards innovation and best practice.

This approach provided for a consistent methodology to develop the Work Program ensuring completeness and transparency so that all inputs were addressed. The details of the program of activities can be found in the following pages.

Figure 7 System-Wide Data Review Approach



PROGRAM OF ACTIVITIES

The program of activities for each domain describes the end-to-end solution to addressing the Terms of Reference and the recommendations from the external reviews.

Domains

The program of activities are grouped by domains.

D1 – Data management. The design and architecture of the systems and processes, which store and prepare ACT Health data for analysis and reporting.

D2 – Data governance. The structures and rules in place to provide direction, oversight and accountability to the use of ACT Health data and the reporting of information.

D3 – Data quality. The accuracy, reliability, validity and timeliness of ACT Health data.

D4 – Metadata management. Documenting ACT Health data so that there is a common understanding of how it is defined and how it should be interpreted.

D5 – Data security and privacy. The secure storage and access to sensitive information, as well as the measures put in place to ensure that the information is maintained in accordance with all privacy requirements.

D6 – Workforce. Organising teams working with data and enabling successful data management practices through training and communication.

D7 – Communication. The channels through which ACT Health staff can get information and assistance.

D8 – Change management. The rules, procedures and policies put in place to ensure that changes to ACT Health data or reporting of information are communicated, approved and implemented in a consistent and structured manner.

D9 – Information and insights. The wide range of reporting and analytics capabilities for ACT Health. It includes mandatory reporting to external bodies, as well as the delivery of insightful analytics and reporting capable of driving strategic and operational decision-making.

The program of activities by domain

For each domain, the following have been identified:

- Key findings
- Applicable System-Wide Data Review Terms of Reference
- The approach including framework considerations
- The program of activities including:
 - Immediate actions (underway or completed) [✓]
 - Future activities (to be completed) [❖]
 - Impact (of activities) [●]

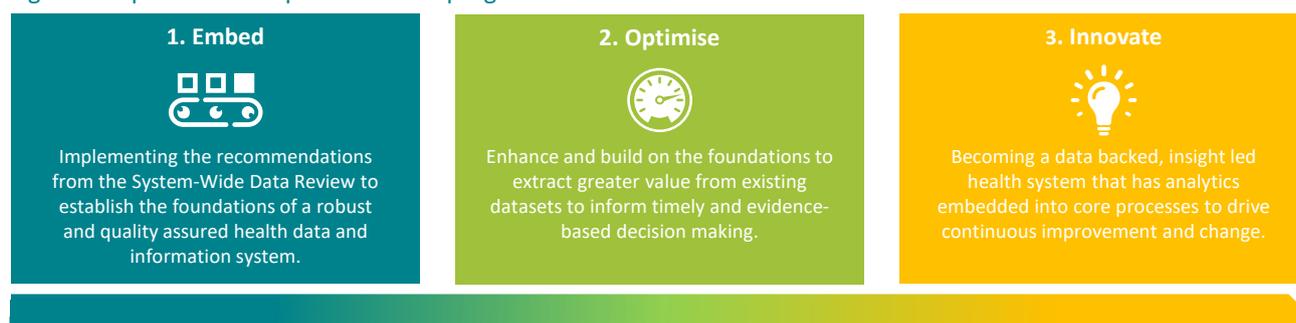
Each activity has been flagged to identify whether they were established as a direct response to the System-Wide Data Review Terms of Reference or whether they are development activities beyond the review, as per the table below.

-
- Activities identified to address the System-Wide Data Review Terms of Reference.
 - Development activities beyond the System-Wide Review to deliver ACT Health's long-term strategy.
-

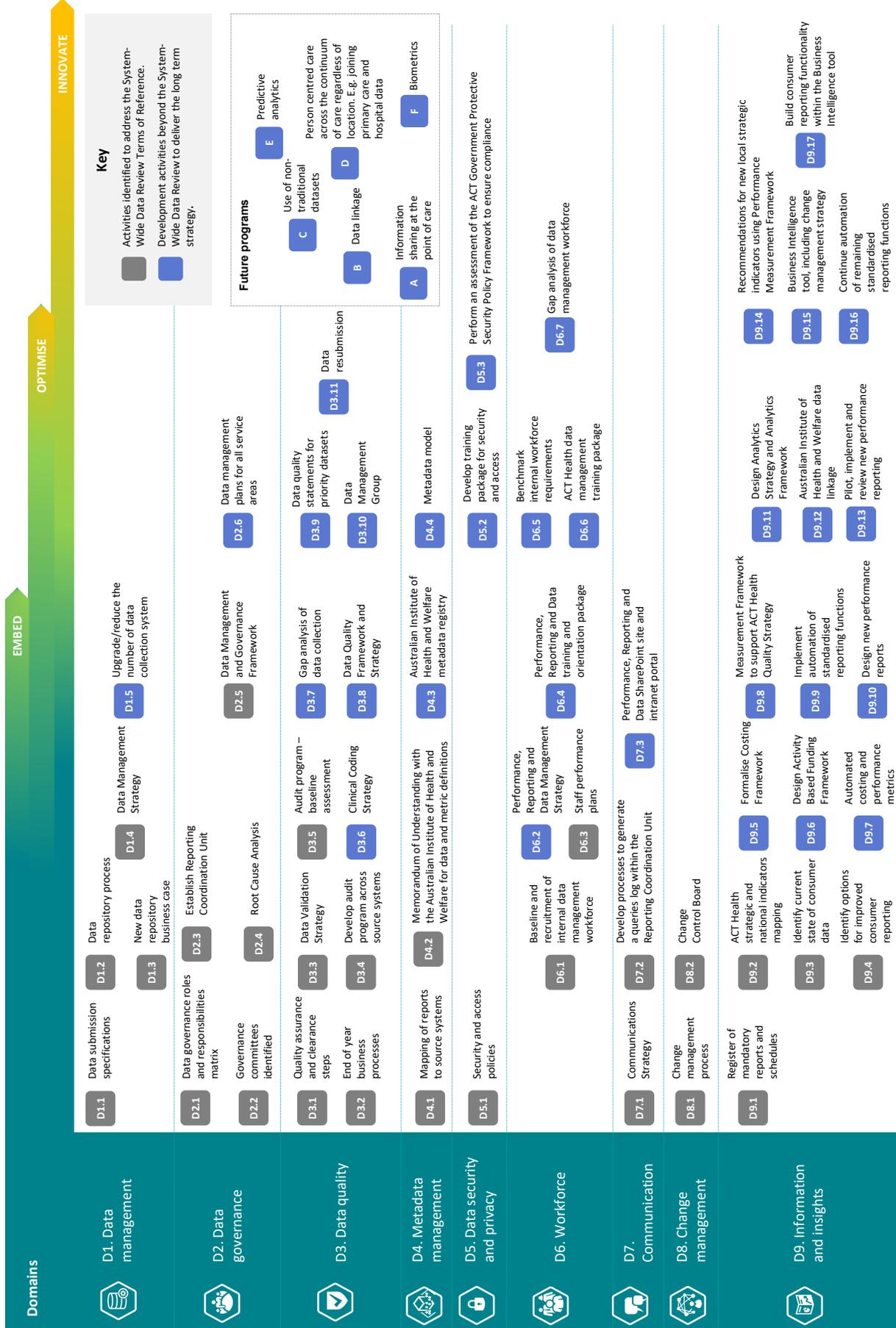
Implementation phases

All activities have been mapped out overleaf in Figure 8 by domain and against one of the three strategy implementation phases as defined below.

Figure 8 Implementation phases for the program of activities



ACTIVITIES BY DOMAIN



D1 – DATA MANAGEMENT

In the context of the System-Wide Data Review, data management refers specifically to the design, architecture and documentation of the systems and processes, which collect, store and prepare ACT Health data for analysis and reporting.

Key findings

The recommendations from external reviews highlighted inconsistencies in some datasets as a result of minimal documentation of the data extraction, transformation and loading processes. The detailed recommendations from external reviews are outlined in Appendix 2.

Relevant Terms of Reference

The System-Wide Data Review Terms of Reference specified the following outcomes, which have been mapped to the data management domain. A summary of the response to the Terms of Reference is provided in Appendix 1.

Table 1 Terms of Reference mapped to the data management domain

Terms of Reference	
3.	Develop a Framework for the provision of essential data reports derived directly from source systems as an interim process. This will ensure that ACT Health internal and external reporting requirements can be maintained and will comprise of:
3.4	Replicating systems for reporting purposes and writing queries to generate reports from the replicated data
3.	Replacement of the ACT Health data warehouse*, reporting and analysis systems and functions. This will include how we propose to:
3.5	Reconstruct the warehouse to ensure that it accurately extracts and transforms data from source systems
3.6	Deliver and publish datasets for each time period
3.7	Develop Application Programming Interfaces (APIs) to publish data in real-time for required data sets (such as Emergency Department waiting times)
3.8	Integrate relevant de-identified data into the ACT Government Data Lake
3.9	Re-write the data queries required to accurately generate reports

*Note: The Terms of Reference of the System-Wide Data Review refer to replacing the ACT Health data warehouse. Further analysis of ACT Health's data requirements indicated that building a data repository was the most appropriate solution to address the Terms of Reference. As such, the terminology throughout this report references a 'data repository' rather than a 'data warehouse', except in those cases where the Terms of Reference or recommendations from the external reviews are quoted.

Approach

To address the recommendations from external reviews and the Terms of Reference, end-to-end solutions needed to be developed. As such, a program of activities was developed considering key elements of a systems framework including factors outlined in the table below.

Table 2 Systems framework considerations

Framework consideration	Significance
Specifications	Specifications are used to describe the content and structure of data to be included in a submission. They provide consistency with and alignment to national and local data submission requirements. They also are paramount for maintaining business continuity.
Assurance	Assurance processes are created to ensure that the data extracted from source systems, transformed or loaded through to final reporting is free from errors. Assurance processes can prevent potential errors including incorrect inclusion, exclusion or duplication of the data from multiple sources.

Framework consideration	Significance
Systems	<p>Systems in the context of data management refer to typically a suite of computer programs (or computer software applications) designed to manage a database, a large set of structured data, and run operations on the data requested by numerous users.</p> <p>Data management systems allow the definition, creation, querying, update, and administration of databases.</p>
Architecture	<p>Architecture in the context of data management can be defined as ‘most of what needs to be done before getting started’. This includes developing a data model, planning out databases and table structures, and determining the key data flows and integrations that will need to happen between systems.</p> <p>Data architecture provides a formal approach to creating and managing the flow of data and how it is processed across an organisation’s IT systems and applications.</p>
Validation	<p>Validation is the process of checking for errors in data items and supporting greater/improved data quality, a credentialed or robust system would have all of these characteristics in its validation processes:</p> <ul style="list-style-type: none"> • All data items are checked either by the source system at data entry or through the use of error/edit reports • There are documented processes for resolution of errors • Feedback is documented and provided to individuals regarding data entry errors • Data quality is monitored and resolution of issues is carried out • The validation process has been credentialed by a formal committee overseeing data governance.
Integrity	<p>Data integrity is the maintenance, assurance, accuracy and consistency of data over its entire life-cycle, and is a critical aspect to the design, implementation and usage of any system which stores, processes, or retrieves data.</p>

Program of activities – immediate actions

The following table describes the immediate actions taken to address the System-Wide Data Review.

Table 3 Program of activities – immediate actions for the data management domain

D1 – Data management	
Immediate actions (completed or underway)	D1.1 Developed specifications for data submission to meet external reporting requirements <ul style="list-style-type: none"> ✓ Specifications for data submission from various systems and sources to meet external reporting requirements have been developed to provide consistency with and alignment to national and local data submission requirements.
	D1.2 Developed data repository process monitoring reports <ul style="list-style-type: none"> ✓ In developing the ACT Health data repository and associated capability tools within the platform, processes have been designed to monitor the collection of data from their source to the final output. ✓ Metadata analysis tools will be used to automate scanning of source systems, processes and logs to provide data lineage, statistical information on tables and structures and access activity capture.
	D1.3 Obtained approval for a new data repository by developing a business case <ul style="list-style-type: none"> ✓ A business case to develop a new data repository was submitted and approved. The new repository will establish a robust, assured and documented Operational Data Hub to enable reporting including: operational reporting, performance reporting, annual reporting, quarterly reporting and national submissions (including, for example, the Australian Institute of Health and Welfare and the Report on Government Services). ✓ The new data repository will utilise industry leading technologies for real time data processing and analytics and will enable ACT Health to build a consolidated 360 degree view of patient data.
	D1.3 Commenced development of a new data repository with well documented and validated processes <ul style="list-style-type: none"> ✓ Work has begun to build this repository so that: <ul style="list-style-type: none"> – Validations exist at different stages in the extract, load and transform processes – Extract, load and transform processes are documented and designed in accordance with agreed upon business rules – Data in source systems can be reconciled to data in the repository – The correct business logic is used when reporting from the data repository.

Program of activities – recommended future activities

The following table describes the recommended future activities to achieve ACT Health’s Performance, Reporting and Data Management Vision over the next three years.

Table 4 Program of activities – Future activities for the data management domain

D1 – Data management	
Future activities (to be completed)	D1.1 Align data repository with local and national submission specifications ❖ Ensure that data field definitions align with national and local data submission requirements.
	D1.3 Build the new data repository ❖ Complete the build of the new data repository.
	D1.4 Embed a Data Management Strategy ❖ In line with the capabilities of the new data repository, develop a Data Management Strategy.
	D1.5 Upgrade/reduce the number of data collection systems across ACT Health ❖ The Performance, Reporting and Data function will work with the Digital Solutions Division to consider options for implementing a single patient management system across priority datasets and standardise data management policies and procedures.
Impact (of activities)	<ul style="list-style-type: none"> • The rebuild of the data repository, including the rebuild and validation of extract, load and transform processes will provide greater confidence in the reliability and accuracy of ACT Health data. • This will provide a robust platform to perform accurate reporting and insightful analytics going forward. • The Master Data and Reference Management Strategy will provide a clear direction for maintaining, managing and improving ACT Health data management systems and processes going forward. • This will achieve a greater level of consistency in ACT Health local and national data submissions.

D2 – DATA GOVERNANCE

In the context of the System-Wide Data Review, data governance refers to the structures and rules in place to provide direction, oversight and accountability to the use of data and the reporting of information to meeting the needs of ACT Health and its stakeholders.

Key findings

There was an understanding of roles and responsibilities relating to data management within ACT Health, however this was not well documented or communicated to external stakeholders. Further the recommendations of the external reviews identified that a Data Management and Governance Framework should be developed, including formalising staff roles and responsibilities with regards to data. Improved processes should also be implemented to coordinate the significant number of data requests and to ensure that data was released using a consistent and controlled process. The detailed recommendations from the external reviews are outlined in Appendix 2.

Relevant Terms of Reference

The System-Wide Data Review Terms of Reference specified the following outcomes, which have been mapped to the data governance domain. A summary of the response to the Terms of Reference is provided in Appendix 1.

Table 5 Terms of Reference mapped to the data governance domain

Terms of Reference	
2.	Establish revised governance processes and protocols for data management, reporting and analysis. Features of these processes and protocols will include:
2.3	Clear delineation of responsibility for managing different stages of the extraction, transformation and reporting and analysis of data

Approach

To address the recommendations from external reviews and the Terms of Reference, end-to-end solutions needed to be developed. As such, a program of activities was developed which considered the key elements of a data governance framework as described in the table below.

Table 6 Data governance framework considerations

Framework consideration	Significance
Structures	Refers to the committees and groups established to oversee the data management process.
Stewardship	The owners assigned to individual data sets who are responsible for ensuring that the data is maintained in accordance with policies.
Lifecycle management	The data lifecycle includes a number of stages including the collection, storage, access and release, use and disposal of data. Appropriate governance is required for each stage in this lifecycle.
Management plans	Defines the roles and responsibilities for all data management between the data branch and the business unit for example: mandatory reporting to external agencies, timeframes, policy issues and comprehensive data specifications.
Risk management	Relates to the plans put in place to assess and address any issues that arise with the maintenance or use of data.
Coordination	Refers to how the governance committees, stewards and all other staff cooperate to ensure data is governed appropriately.

Program of activities – immediate actions

The following table describes the immediate actions taken to address the System-Wide Data Review.

Table 7 Program of activities - immediate actions for the data governance domain

D2 – Data governance	
Immediate actions (completed or underway)	D2.1 Developed and embedded data governance roles and responsibilities <ul style="list-style-type: none"> ✓ Roles and responsibilities for data management are defined through the data management lifecycle in the ACT Health data roles and responsibilities matrix. ✓ Responsibilities within the matrix have been assigned using the following descriptions and have been in place since late 2016: <ul style="list-style-type: none"> – R - Responsible for executing the task – A - Accountable for the outcome of the task, whether positive or negative and represents the sole decision-making authority – C - Consulted throughout the duration of the work and may provide advice as a subject matter expert – I - Informed of the outcome/progress.
	D2.2 Established executive level leadership for data governance <ul style="list-style-type: none"> ✓ Established an expert Review Panel to advise and oversee the System-Wide Data Review. ✓ Established an internal executive committee overseen by the ACT Health Director-General. ✓ Established a Calvary Data Management Group to develop a transparent program of reporting.
	D2.2 Identified appropriate data governance committees <ul style="list-style-type: none"> ✓ A number of new committees have been identified for establishment to ensure that best practice and well informed advice is available. For example a new Clinical Coding Committee has recently been established that includes clinical coders from across ACT public and private hospitals and some New South Wales facilities. This committee is critical to inform future coding initiatives, training and development and provides advice on behalf of ACT Health in regards to national classification requirements impacting ACT hospitals.
	D2.3 Established the Reporting Coordination Unit to provide a centralised point of data release, requests and help desk functionality <ul style="list-style-type: none"> ✓ The functions of the Reporting Coordination Unit include: <ul style="list-style-type: none"> – Receives internal and external data requests, clearance requests, and variation requests – Coordinates and monitors data requests, clearance requests, ongoing data reports, and variation requests – Releases data and information regarding data/clearance requests.
	D2.4 Commissioned an external independent Root Cause Analysis <ul style="list-style-type: none"> ✓ The independent Root Cause Analysis was conducted to identify the underlying drivers of any data issues, determine priority issues and develop recommendations for ACT Health moving forward. Further detail is outlined on page 51.
	D2.5 Developed data management frameworks, policies and processes <ul style="list-style-type: none"> ✓ The Data Management and Governance Framework has been drafted. ✓ A mandatory reports register has been defined to ensure all data requests are reported on time and within specification.
	D2.6 Commenced pilots to embed data management plans across business units in ACT Health <ul style="list-style-type: none"> ✓ Management plans have been drafted and piloted with some business units.

Program of activities – recommended future activities

The following table describes the recommended future activities to achieve ACT Health’s Performance, Reporting and Data Management Vision over the next three years.

Table 8 Program of activities - future activities for the data governance domain

D2 – Data governance	
Future activities (to be completed)	D2.2 Continuous oversight and review from governance committees <ul style="list-style-type: none"> ❖ Committees to meet regularly and report to a tier one committee to ensure direction and oversight and to balance alignment with ACT Health’s requirements and strategic directions.
	D2.4 Action findings and recommendations of the Root Cause Analysis <ul style="list-style-type: none"> ❖ Following the Root Cause Analysis findings and recommendations will be incorporated into the program of future development activities for the Performance, Reporting and Data Management Strategy.
	D2.5 Finalise and embed the Data Management and Governance Framework <ul style="list-style-type: none"> ❖ This framework will be widely communicated and embedded into day to day operations at all levels.
	D2.5 Finalise and embed data custodian and ownership policies <ul style="list-style-type: none"> ❖ Established a register of owners for various data sources maintained by ACT Health.
	D2.6 Rollout data management plans for all business units <ul style="list-style-type: none"> ❖ Develop and agree scope for the remaining business units including consolidation of data management policy issues to develop a list of priority issues for ACT Health.
Impact (of activities)	<ul style="list-style-type: none"> • Continued senior leadership will ensure that the lessons learnt from the System-Wide Data Review and the solutions identified thereafter persist well into the future and are aligned and support future strategies. • The data management plans will ensure that all business units have clearly defined and accountable expectations each financial year. The plans will also ensure that policy issues result in strategically aligned goals relating to data, and that these goals have the appropriate oversight and governance. • The Reporting Coordination Unit will help to ensure that internal and external reporting is consistent, meeting ACT Health’s national mandatory reporting obligations, and releasing data in accordance with policy. • The Reporting Coordination Unit will also ensure that stakeholders have a single point of reference for ACT Health data including help desk functionality for internal staff. • The Data Management and Governance Framework will provide best practice guidance to all staff.

D3 – DATA QUALITY

In the context of the System-Wide Data Review, data quality relates to the accuracy, reliability, validity and timeliness of ACT Health data.

Key findings

There had been significant improvement in the data validation processes for all data released from ACT Health however, improvements were required to ensure the appropriateness and effectiveness of the processes. In addition, the recommendations from the external reviews noted that ACT Health should strive for a robust data quality strategy to ensure all elements of best practice data management embed over time. The detailed recommendations from the external reviews are outlined in Appendix 2.

Relevant Terms of Reference

The System-Wide Data Review Terms of Reference specified the following outcomes, which have been mapped to the data quality domain. A summary of the response to the Terms of Reference is provided in Appendix 1.

Table 9 Terms of Reference mapped to the data quality domain

Terms of Reference	
2.	Establish revised governance processes and protocols for data management, reporting and analysis. Features of these processes and protocols will include:
2.4	Clearly defined quality assurance and clearance steps for all data reporting and analysis

Approach

To address the recommendations from external reviews and the Terms of Reference, end-to-end solutions needed to be developed. As such, a program of activities was developed which considered the key elements of a Data Quality Framework as described in the table below:

Table 10 Data Quality Framework considerations

Framework consideration	Significance
Standards	Clear definitions and standards for the qualities associated with good data are critical to being able to assess data quality.
Validation	As data is entered, collected and used, it needs to be validated to ensure that any transformations still yield reasonable and accurate data.
Assurance	Validation of data should lead to internal statements of assurance regarding the quality of data.
Metrics	To continually monitor data quality, metrics need to be set up which provide a high level indication of the data's validity and accuracy.
Integrity	Checks and balances need to be put in place to ensure that data cannot be inappropriately modified. Data and analysis needs to be able to be trusted.
Revision	Regular reviews of data, particularly with regards to changing patterns in the data can provide an early indication of potential changes in the quality of the data.
Audit	Regular external audits of data quality help to identify improvements that can be made to keep up with best practices.
Training	Regular training is critical to ensure that staff remain up to date with data quality standards.

Program of activities – immediate actions

The following table describes the immediate actions taken to address the System-Wide Data Review.

Table 11 Program of activities - immediate actions for the data quality domain

D3 – Data quality	
Immediate actions (completed or underway)	D3.1 Reviewed and updated the formal quality assurance process <ul style="list-style-type: none"> ✓ A formal quality assurance process (requiring multiple levels of review and approval) has been put in place to ensure that information released is produced with the appropriate governance.
	D3.2 Established end of year business processes to validate data <ul style="list-style-type: none"> ✓ New processes were implemented to compile the datasets for 2016-17 reports. ✓ Data used for reporting to national agencies and populating the annual reports were isolated to ensure consistent reporting.
	D3.6 Developing a Clinical Coding Strategy <ul style="list-style-type: none"> ✓ The Clinical Coding Strategy has been drafted and includes a range of strategies to optimise the clinical coding process including: stabilising the clinical coding workforce, ensuring coding completion within specified timeframe, improving clinical documentation Optimise Clinical Coding accuracy and Diagnosis Relation Group allocation.
	D3.8 Commenced development of a Data Quality Framework in line with the ACT Government Office of the Chief Digital Officer <ul style="list-style-type: none"> ✓ The Data Quality Framework will support the improvement of data quality across ACT Health. ✓ The objective of the Data Quality Framework is to provide standards for data quality and enable data users: <ul style="list-style-type: none"> – to assess the data quality of data with reference to the specific purpose and requirement – to assure that the data is fit for purpose.
	D3.8 Commenced development of a Data Quality Strategy <ul style="list-style-type: none"> ✓ Preliminary research has been undertaken assessing the core components for a robust Data Quality Strategy including reviewing best practice across other states and territories and national statistics agencies such as the Australian Bureau of Statistics.
	D3.10 Established the Data Management Group and associated Terms of Reference <ul style="list-style-type: none"> ✓ This group will ensure that appropriate data and technologies are provided to inform insights, analysis and reporting requirements.

Program of activities – recommended future activities

The following table describes the recommended future activities to achieve ACT Health’s Performance, Reporting and Data Management Vision over the next three years.

Table 12 Program of activities - future activities for the data quality domain

D3 – Data quality	
Future activities (to be completed)	D3.3 Embed a Data Validation Strategy to ensure transparency <ul style="list-style-type: none"> ❖ The strategy supports end-to-end data validation to ensure that the processes from source systems to reporting are consistent.
	D3.4 Develop an audit program across source systems <ul style="list-style-type: none"> ❖ A rolling annual audit program to assess the quality of data across the core systems, will result in traceability of a sample of patients from initial data entry to final reporting.
	D3.5 Undertake a baseline assessment of data quality through an audit program of the system <ul style="list-style-type: none"> ❖ This will provide an initial assessment of ACT Health data quality and identify areas for improvements.
	D3.6 Embed the Clinical Coding Strategy <ul style="list-style-type: none"> ❖ Implement the clinical coding strategy which will allow the coding team to deliver complete, timely and accurate clinical coding to support strategic and operational requirements and to ensure appropriate cost recovery through Activity Based Funding for ACT Health.
	D3.7 Undertake a gap analysis of data collections <ul style="list-style-type: none"> ❖ Undertake reconciliations of data sets to identify any gaps in collection.
	D3.8 Finalise and embed the Data Quality Framework and Strategy <ul style="list-style-type: none"> ❖ Once finalised the Data Quality Framework and Strategy will be socialised and embedded across ACT Health.
	D3.9 Develop data quality statements for priority datasets <ul style="list-style-type: none"> ❖ Develop data quality statements for each priority dataset to provide a measure of each component of quality, for example, accuracy, and appropriateness. This process will result in benchmarking and identify improvements moving forward for each dataset.
	D3.11 Undertake data resubmissions <ul style="list-style-type: none"> ❖ Resubmit data for past years if gaps are identified in collection processes.
Impact (of activities)	<ul style="list-style-type: none"> • Improved consistency, reliability and confidence in the information reported by ACT Health. • Improved strategic and operational decision-making by the use of high quality data. • The work will be undertaken in a transparent way, supported by ownership and accountability by ACT Health.

D4 – METADATA MANAGEMENT

In the context of the System-Wide Data Review, metadata management relates to the documentation of data so that there is a common understanding of how it is defined and how it should be interpreted. This information includes data definitions, data models and data flows.

Key findings

ACT Health had undertaken significant work with regards to metadata such as definitions, however this was not readily accessible to all staff. In addition, it was identified that when new data fields were introduced, there was poor visibility and communication which resulted in a poor understanding of the metadata requirements. The detailed recommendations from external reviews are outlined in Appendix 2.

Relevant Terms of Reference

The System-Wide Data Review Terms of Reference specified the following outcomes, which have been mapped to the metadata management domain. A summary of the response to the Terms of Reference is provided in Appendix 1.

Table 13 Terms of Reference mapped to the metadata management domain

Terms of Reference	
3.	Develop a Framework for the provision of essential data reports derived directly from source systems as an interim process. This will ensure that ACT Health internal and external reporting requirements can be maintained and will comprise of:
3.3	Mapping the data definitions against the source systems to identify the systems required to generate reports

Approach

To address the recommendations from the external reviews and the Terms of Reference, end-to-end solutions needed to be developed. As such, a program of activities was developed considering key elements of a metadata framework, including factors outlined in the table below.

Table 14 Metadata Framework considerations

Framework consideration	Significance
Standards	Standards for the minimal level of documentation required for each data source will ensure consistency in the recorded metadata across the system.
Definitions and dictionary	Critical to the appropriate use and interpretation of data is a clear set of easy to access data definitions. These definitions are often combined into data dictionaries.
Specifications	As new source systems are introduced, clear data specifications ensure that the data collected aligns with the intended use case.
Metrics	Metrics of data quality need to be included in a metadata model to ensure that all users are aware of potential data limitations.
Audit	Regular audits of metadata completeness and accuracy are critical to ensuring that data is used and interpreted correctly.
Training	Training staff in the use of data dictionaries and metadata models will allow for consistent interpretation and reporting.

Program of activities

The following table describes the immediate actions taken to address the System-Wide Data Review, and the recommended future activities to achieve ACT Health’s Performance, Reporting and Data Management Vision over the next three years.

Table 15 Program of immediate actions and future activities for the metadata management domain

D4 – Metadata management		
Immediate actions (completed or underway)	D4.1	Undertook a mapping exercise of reports to data items of source systems <ul style="list-style-type: none"> ✓ The derivation of data reports and reporting elements originating directly from source systems was mapped out. This identified nine major source systems from which data is drawn to support the reports.
	D4.2	Developing a Memorandum of Understanding to use the Australian Institute of Health and Welfare online data repository for data and metric definitions <ul style="list-style-type: none"> ✓ ACT Health are currently working with the Australian Institute of Health and Welfare to adopt their data specifications and map existing values to their definition.
Future activities (to be completed)	D4.3	Ongoing development and rollout of the Australian Institute of Health and Welfare data definitions <ul style="list-style-type: none"> ❖ Complete work with the Australian Institute of Health and Welfare to adopt their data definitions. ❖ Publish definitions online for user ease of accessibility.
	D4.4	Develop a metadata model <ul style="list-style-type: none"> ❖ Establish and maintain a metadata model to support the consistent interpretation of data from source systems to usage.
Impact (of activities)		<ul style="list-style-type: none"> • These activities will ensure that ACT Health data definitions are well understood, easily accessible and consistent with national definitions.

D5 – DATA SECURITY AND PRIVACY

In the context of the System-Wide Data Review, data security and privacy relates specifically to the secure storage and use of sensitive information, as well as the measures put in place to ensure that the information is maintained in accordance with all privacy requirements.

Key findings

Policies and protocols for data access and security were evident and embedded across ACT Health, however, the impact of their application was not clearly understood by all staff. Further there was a need to review access rights to the raw data to ensure that this data could only be accessed by appropriately accredited staff. The detailed recommendations from external reviews are outlined in Appendix 2.

Relevant Terms of Reference

The System-Wide Data Review Terms of Reference specified the following outcomes, which have been mapped to the security and privacy domain. A summary of the response to the Terms of Reference is provided in Appendix 1.

Table 16 Terms of Reference mapped to the security and privacy domain

Terms of Reference	
2.	Establish revised governance processes and protocols for data management, reporting and analysis. Features of these processes and protocols will include:
2.5	Appropriate access controls and audit information for all data sets

Approach

To address the recommendations from external reviews and the Terms of Reference, end-to-end solutions needed to be developed. As such, a program of activities was developed which considered the key elements of a security and privacy framework as described in the table below.

Table 17 Security and Privacy Framework considerations

Framework consideration	Significance
Access control	The controls put in place to allow (or disallow) a user from accessing and/or editing data are generally referred to as access controls.
Classification	In the context of data security and privacy, a classification system identifies and grades the confidentiality requirements of official data and information.
Architecture	Architecture in the context of data management can simply be defined as ‘most of what needs to be done before getting started’. This includes developing a data model, planning out databases and table structures, and determining the key data flows and integrations that will need to happen between systems. Data architecture provides a formal approach to creating and managing the flow of data and how it is processed across an organisation’s IT systems and applications.
Encryption	Encryption refers to the broad set of technologies and algorithms used to ensure that information remains private even if it is accessed without authorisation. Broadly, this involves scrambling the data using an algorithm that is only reversible with the knowledge of a secret key.
Security plans	The purpose of the system security plan is to provide an overview of the security requirements of the system and describe the controls in place or planned for meeting those requirements. The system security plan also delineates responsibilities and expected behaviour of all individuals who access the system.
Audit	An IT security audit is a manual or systematic measurable technical assessment of the security of a system or application. Manual assessments include performing security vulnerability scans, reviewing application and operating system access controls, and analysing physical access to the systems.
Training	Training in this case refers specifically to the training provided to staff regarding their data roles and responsibilities, including the practices they need to adopt to ensure that data remains secure.

Program of activities

The following table describes the immediate actions taken to address the System-Wide Data Review, and the recommended future activities to achieve ACT Health’s Performance, Reporting and Data Management Vision over the next three years.

Table 18 Program of immediate actions and future activities for the security and privacy domain

D5 – Data security and privacy	
Immediate actions (completed or underway)	D5.1 Reviewed and amended data access rights through audits <ul style="list-style-type: none"> ✓ Access rights to the data repository were removed for all users except for accredited staff. ✓ Other staff requiring access have had to re-apply using a formal process. Access can only be approved by the data repository manager.
	D5.1 Revised data access policies and protocols <ul style="list-style-type: none"> ✓ Security, privacy and access policies have been reviewed to identify gaps. ✓ Policies have been consolidated where possible. ✓ A system access control policy has been developed.
Future activities (to be completed)	D5.1 Build the new data repository and embed data access protocols <ul style="list-style-type: none"> ❖ A data security management system (a part of the data repository) will log and register: <ul style="list-style-type: none"> – history of database access, record search, record extraction, record entry, record completion and record change actions; and – write access to report files will be restricted to the team that actively manages the reports (after the new data repository is built).
	D5.1 Undertake rolling data access audits <ul style="list-style-type: none"> ❖ A rolling audit program will be undertaken which will include a review of unusual patterns of access particularly systematic record changes.
	D5.2 Develop and rollout staff training package for security and access <ul style="list-style-type: none"> ❖ A training program will be developed to guide staff of the appropriate methods to access, store and disseminate data.
	D5.2 Conduct ongoing staff training relating to data security and privacy <ul style="list-style-type: none"> ❖ Develop a strategy to ensure staff are continually aware of roles and responsibilities in regards to the use, storage and release of data.
	D5.3 Perform an assessment of the ACT Government Protective Security Policy Framework to ensure compliance <ul style="list-style-type: none"> ❖ Assess compliance with security and privacy legislation and frameworks ❖ Perform a readiness assessment of ACT Health’s ability to conform with anticipated future data security and privacy requirements.
Impact (of activities)	<ul style="list-style-type: none"> • Restriction of data access rights to only appropriate staff will ensure accurate release of raw datasets for reporting. • Robust policies and processes ensure that data is managed in accordance with legislated reporting requirements and standards. • Data access policies and training will ensure that new and existing staff have a clear understanding of their responsibilities when handling data, and are kept up to date if any changes to these policies occur.

D6 – WORKFORCE

In the context of the System-Wide Data Review, workforce relates to the best practices and considerations for organising teams working with data and enabling successful data management practices through training and communication. The ACT Health workforce includes staff working directly with the data, all the way through to the clinicians using the data.

Key findings

There are pockets of data and analytics expertise across ACT Health, however the understanding of the importance of data quality needs to be increased given the importance of having complete and accurate datasets which inform national reform activities, such as Activity Based Funding. Therefore, it was found that ACT Health would benefit from developing a data training program for staff to improve their understanding of why data is collected, the importance of quality data entry, and how it should be used, reported and interpreted. Whilst some of this training already existed, it was not consistent across ACT Health. The detailed recommendations from the external reviews are outlined in Appendix 2.

Approach

To address the recommendations from external reviews and the Terms of Reference, end-to-end solutions needed to be developed. As such, a program of activities was developed considering key elements of a training and recruitment framework including factors outlined in the table below.

Table 19 Training and Recruitment Framework considerations

Framework consideration	Significance
Skills assessment	Skills assessment is a component of strategic workforce planning that provides an understanding of the current workforce environment, including capabilities, skills and aptitudes.
Performance plans	Performance plans are key to aligning staff goals and objectives to the departmental and organisational objectives. Individual performance plans are also critical to identify individual's opportunities for development including identifying how and by when will this be achieved.
Gap Analysis	A strategic workforce planning tool that provides clarity on workforce requirements for the future to meet priorities and strategic objectives, versus what currently exists within the workforce environment. It can support recruitment initiatives as well as developing appropriate training packages.
Roles and Responsibilities	Defining roles and responsibilities is a component of workforce management that supports recruiting appropriately skilled staff and provides clarity in running day to day operations.
Recruitment	Recruitment is a key activity of workforce management, ensuring the future workforce requirements of the organisation are planned for.
Orientation	Orientation is a best practice for on boarding new staff, it can support new staff to adjust to the social and performance aspects of their new roles quickly, and it is the process through which new staff learn the attitudes, knowledge, skills, and behaviours required to function effectively within the organisation.
Training	Training is an investment that supports improving the skills, knowledge, capability, capacity, productivity and performance of staff through teaching, and/or developmental activities. Training programs will ensure that the branch develops an environment of ongoing innovation and a continually learning environment.

Program of activities

The following table describes the immediate actions taken to address the System-Wide Data Review, and the recommended future activities to achieve ACT Health's Performance, Reporting and Data Management Vision over the next three years.

Table 20 Program of immediate actions and future activities for the workforce domain

D6 – Workforce	
Immediate actions (completed or underway)	<p>D6.1 Undertaken baseline assessment of internal data management workforce</p> <ul style="list-style-type: none"> ✓ A baseline assessment of staff numbers and skills mix has been performed. ✓ Position descriptions have been reviewed.
	<p>D6.2 Developed a high level strategic plan for the Performance, Reporting and Data function</p> <ul style="list-style-type: none"> ✓ An assessment was undertaken in December 2017, which included developing a high level strategic plan including the division's vision and strategic objectives.
	<p>D6.3 Developed processes and communication to have staff performance plans in place</p> <ul style="list-style-type: none"> ✓ Processes and documentation guides for the development of staff performance plans are available for use by all Performance, Reporting and Data function staff.
	<p>D6.4 Developed orientation training packages for Performance, Reporting and Data staff</p> <ul style="list-style-type: none"> ✓ An orientation package for staff has been developed for the Performance, Reporting and Data functions.
	<p>D6.6 Completion of a training package for the Emergency Department Information System made mandatory prior to system access</p> <ul style="list-style-type: none"> ✓ Canberra Hospital implemented a mandatory requirement for staff to complete Emergency Department Information System training before receiving access to the system.
Future activities (to be completed)	<p>D6.2 Embed and implement the strategic plan</p> <ul style="list-style-type: none"> ❖ Disseminate, embed and implement the division's vision and strategic objectives.
	<p>D6.3 Ensure that all staff continue to have performance plans in place</p> <ul style="list-style-type: none"> ❖ Develop and ensure completion rates for all staff performance plans in line with strategic objectives of the Performance, Reporting and Data Management Strategy.
	<p>D6.4 Further develop the Performance, Reporting and Data training packages</p> <ul style="list-style-type: none"> ❖ Further training packages (including e-learning) are to be developed for staff accessing data. ❖ Improve completion rates for the training packages that have been developed.
	<p>D6.5 Benchmark internal workforce requirements</p> <ul style="list-style-type: none"> ❖ This work will be included with the ACT Health Workforce Strategy. ❖ Analyse all existing Performance, Reporting and Data position descriptions and determine mandatory skillsets/qualifications and current data management training requirements.
	<p>D6.6 Develop ACT Health data management training packages</p> <ul style="list-style-type: none"> ❖ Develop and implement a training package in appropriate collecting, storage, access, and release of health information including security and ethics training.
	<p>D6.7 Perform a gap analysis of the data management workforce</p> <ul style="list-style-type: none"> ❖ Develop an understanding of any workforce capability and capacity shortages (to be undertaken post D6.5).
	<p>Impact (of activities)</p> <ul style="list-style-type: none"> • Staff will have access to resources that will enable them to better understand and use the data available to them, as well as their responsibilities when it comes to handling that data. • This will provide clarity for both the division and individual staff about their future direction, goals and priorities going forward. • This has provided an understanding of the skills currently available as well as the skills and training required going forward to equip staff to support the ACT Health Performance, Reporting and Data Management Strategy.

D7 – COMMUNICATION

In the context of the System-Wide Data Review, communication relates to the channels through which ACT Health staff can get information and assistance.

Key findings

The recommendations from external reviews identified a clear need to better communicate changes across ACT Health regarding the requirement for new data items and collections. It was also identified that staff required mechanisms to access advice from data analysts for assistance in dealing with data queries. The detailed recommendations from the external reviews are outlined in Appendix 2.

Approach

An immediate action to support the System-Wide Data Review was to establish a help desk to assist staff with data and reporting related queries. Help desk policy framework considerations were developed based on the recommendations from external reviews, Terms of Reference and research on best practice. See the framework considerations in Table 21 below.

In addition to the help desk policy, to address the recommendations from external reviews, broader end-to-end communication solutions were required. As such, a program of activities was developed as outlined in Table 22.

Table 21 Help Desk Policy Framework considerations

Framework consideration	Significance
Accessible	In the context of requests for, or support with, data items, staff across ACT Health should have access to subject matter experts in the areas of data, collection, storage, release and its appropriate use.
Actionable	Requests for data items across ACT Health should be collected and maintained in a recorded query log, supports such that they are traced and actionable. Repeat requests over time, may lead to standard actions being developed, as records are consolidated over time.
Credible, Understandable and Relevant	Data has many levels of maturity as it goes through its lifecycle of collection, storage, access and release and use. As such staff across ACT Health need access to subject matter experts in the data and analysis field to provide advice and support to staff that is understandable, relevant and credible. Given the changing nature of healthcare policy and external requirements, sufficient communications with staff on the implications for data will ensure relevant advice is available.
Timely	Requests for data needs to be prioritised and responded to within appropriate times, based on each individual user case. For example different response time may need to be developed for internal/external requests spanning across different needs including strategic or service level planning, management activities, research, public presentations and publications, and media and research.

Program of activities

The following table describes the immediate actions taken to address the System-Wide Data Review, and the recommended future activities to achieve ACT Health’s Performance, Reporting and Data Management Vision over the next three years.

Table 22 Program of immediate actions and future activities for the communications domain

D7 – Communications	
Immediate actions (completed or underway)	D7.1 Drafted a Communications Strategy and Stakeholder Engagement Plan ✓ Work has commenced on a Communications Strategy and Stakeholder Engagement Plan, including how ACT Health inform, engage and empower ACT Health stakeholders in relation to data and reporting.
	D7.2 Established a help desk to assist staff ✓ Within the Performance, Reporting and Data function, the help desk has been set up within this system for data analytics components in ACT Health, that are managed through the Reporting Coordination Unit (see below).
	D7.2 Developed processes to generate a queries log within the Reporting Coordination Unit ✓ Within the Reporting Coordination Unit a log containing all queries received is maintained, and queries are differentiated according to topic and referred to subject matter experts.
	D7.3 Designed a SharePoint site and intranet portal ✓ A SharePoint and intranet portal is in the process of being developed. ✓ The intranet platform will contain information available for all ACT Health staff members, with the aim of allowing staff to submit data requests to the Reporting and Coordination Unit. ✓ The SharePoint platform provides a workspace for the Performance, Reporting and Data staff members, and authorised access to staff members outside ACT Health.
Future activities (to be completed)	D7.1 Roll out the Communications Strategy and Stakeholder Engagement Plan ❖ Following completion, the plan will be executed.
	D7.1 Develop and distribute regular communications ❖ Develop regular communications to disseminate any new developments with regards to data sources or reporting.
	D7.3 Complete development of the online portals – including SharePoint/intranet site ❖ Fully develop the SharePoint and intranet sites. ❖ Develop a data queries log linked to the data request site to target and refine frequently asked questions.
Impact (of activities)	<ul style="list-style-type: none"> • ACT Health staff have a central point of contact for their data requests, which will reduce the duplication of work, and help ensure consistency in the reporting of data and analysis. • By understanding the nature of common requests, the data queries log will allow identify the key analysis stakeholders find most value. • Regular communication will help to ensure that staff are kept up to date with any changes to the data and systems used in ACT Health.

D8 – CHANGE MANAGEMENT

In the context of the System-Wide Data Review, change management relates to the rules, procedures and policies put in place to ensure that changes to the data or reporting of information are communicated, approved and implemented in a consistent and structured manner.

Key findings

There were robust change management processes for the system and services provided by Shared Services ICT and it was identified that a similar process was required in ACT Health for any change to data, such as new data items and reports. The detailed recommendations from external reviews are outlined in Appendix 2.

Relevant Terms of Reference

The System-Wide Data Review Terms of Reference specified the following outcomes, which have been mapped to the change management domain. A summary of the response to the Terms of Reference is provided in Appendix 1.

Table 23 Terms of Reference mapped to the change management domain

Terms of Reference	
2.	Establish revised governance processes and protocols for data management, reporting and analysis. Features of these processes and protocols will include:
2.2	Formalised change processes for source systems, datasets and data queries to ensure that the impact of changes to any source systems are identified and addressed within the datasets

Approach

To address the recommendations from external reviews and the Terms of Reference, end-to-end solutions needed to be developed. As such, a program of activities was developed which considered the key elements of a change management framework as described in the table below.

Table 24 Change Management Framework considerations

Framework consideration	Significance
Explore and analyse	This stage of the change management process relates to the initial formulation of change requirements. Often this results from exploration and analysis of the data that has revealed ways for the data to be improved.
Consult and assess	In order to ensure that all relevant stakeholders are aware of the proposed changes, and that the full range of consequences of the change are understood, it is imperative to consult with all stakeholders and assess the impacts of the change.
Develop	This stage of the process involves developing the approach for implementing the change.
Pilot and trial	This stage involves testing the proposed changes to ensure that the results align with expectations. It also involves investigating results that do not align with recommendations, and going back to the consult and assess phase if the changes need to be reassessed.
Implement, embed and communicate	Once the changes have been appropriately tested, they can be implemented and finalised, with the results communicated to all relevant stakeholders.

Program of activities

The following table describes the immediate actions taken to address the System-Wide Data Review, and the recommended future activities to achieve ACT Health’s Performance, Reporting and Data Management Vision over the next three years.

Table 25 Program of immediate actions and future activities for the change management domain

D8 – Change management	
Immediate actions (completed or underway)	D8.1 Developed new policies to formalise change processes <ul style="list-style-type: none"> ✓ A formalised change management process has been developed to ensure a flow-on effect of the change is known, communicated, and if necessary mitigated prior to implementation of the change, for example new data requirements, data elements or infrastructure. ✓ Documents created to support this change process include a draft Change Request Policy, Change Request Procedure and Change Request Form. ✓ All change requests will be classified into one of the following five themes: <ul style="list-style-type: none"> – Metadata (technical and functional) – Outputs (report or submission) – Extraction processes – Source system changes – Business/operational changes (ward/clinic). ✓ An impact analysis will be conducted to determine where the change is best addressed. Changes that have an impact on external teams (for example Digital Solution Division, Shared Services ICT) will be assessed through the Change Control Board.
	D8.2 Established a Change Control Board <ul style="list-style-type: none"> ✓ A Change Control Board has been created to oversee and approve any changes to systems and data to ensure alignment and synergies between the two. Example of responsibilities includes metadata, outputs, extraction processes, source system changes and business/operational changes.
Future activities (to be completed)	D8.1 Continue to socialise the change control policies and procedures <ul style="list-style-type: none"> ❖ Finalising and socialising the policies developed across ACT Health through the intranet site and other media including the Change Request Policy, Change Request Procedure and Change Request Form. ❖ Further development activities include developing a Change Request Register.
	D8.2 Continue to maintain ongoing oversight of change requests via the Change Control Board <ul style="list-style-type: none"> ❖ Ongoing oversight of change requests by Change Control Board.
Impact (of activities)	<ul style="list-style-type: none"> • This will help to standardise change requests, and ensure that the changes being requested adhere to the approved parameters. • Ensures that changes to data and reporting are cost effective, strategically aligned, implemented correctly and communicated effectively to all stakeholders.

D9 – INFORMATION AND INSIGHTS

In the context of the System-Wide Data Review, information and insights encompasses a wide range of reporting and analytics capabilities. It includes mandatory reporting to external bodies, as well as the delivery of insightful analytics and reporting capable of driving strategic and operational decision-making.

Key findings

Whilst there was a significant amount of reporting both internally and externally, there was a clear need to develop a consolidated reporting program in ACT Health, including rebasing and ratifying internal and external requirements with stakeholders. It was also noted that ACT Health would benefit from a number of data and analytics frameworks to meet the requirements of best practice data and performance management. In addition, it was found that there already exists significant public reporting of ACT Health data, however navigation of the multiple systems and websites could be made more user friendly, and the information more targeted for the needs of ACT Health consumers. The detailed recommendations from the external reviews are outlined in Appendix 2.

Relevant Terms of Reference

The System-Wide Data Review Terms of Reference specified the following outcomes, which have been mapped to the information and insights domain. A summary of the response to the Terms of Reference is provided in Appendix 1.

Table 26 Terms of Reference mapped to the information and insights domain

Terms of Reference	
2.	Establish revised governance processes and protocols for data management, reporting and analysis. Features of these processes and protocols will include:
2.1	Defined work schedules and steps for key reporting obligations
3.	Develop a Framework for the provision of essential data reports derived directly from source systems as an interim process. This will ensure that ACT Health internal and external reporting requirements can be maintained and will comprise of:
3.1	Identifying the range of essential internal and external reports, and ceasing any reports that are not essential
3.2	Confirming the priority order and timeframes for external reporting

Approach

To address the recommendations from external reviews and the Terms of Reference, end-to-end solutions needed to be developed. As such, a program of activities was developed considering key elements of a systems framework including factors outlined in the table below.

Table 27 Information and Insights Framework considerations

Framework consideration	Significance
Assurance	Assurance in the context of performance reporting relates to ensuring that all mandatory external reporting requirements are met, and that the data included in the reports is free from errors.
Training	Training in the context of performance reporting relates to ensuring that staff are provided with the appropriate skills and capabilities to ensure the quality review procedures are adhered to prior to the release of any data and information, for both internal and external reporting. Training in the policies and procedures in place will ensure the reports meet stakeholder expectations and the reports are fit for the intended use.
Business Intelligence	Healthcare is changing rapidly and so is the need for analytics and business intelligence. Business Intelligence software can provide clinical and managerial staff with on-demand access to reporting and dashboards, providing for timely data to inform decision-making. Business intelligence software often draws its data directly from the data repository, transforming it to analysis or visualisation that allows users to be informed and take action.

Framework consideration	Significance
Analytics	<p>Healthcare analytics is the analysis of healthcare activities and data collected from the different areas of healthcare. The main benefit of using healthcare analytics is to support decision-making of clinical and non-clinical staff across the healthcare systems, to improve patient experience and outcomes in a cost-effective manner.</p> <p>Healthcare analytics software and big data solutions can greatly improve patient outcomes and address biggest priorities of healthcare systems. Examining large volumes of medical and operational data can be helpful to predict and medically investigate potential issues before they become a reality in patient safety signals.</p>
Revision	<p>Revision in the context of performance reports relates to the need to continually adapt reports to changing user requirements. Particularly given the environment is rapidly changing, adapting reporting outputs to meet new or changing legislative, funding and operational requirements is key.</p>
Systems	<p>Advanced healthcare performance systems support moving toward greater efficiency, transparency and accountability, and this trend will continue, particularly in fiscally constrained environments.</p>
Linkages	<p>Data linkage is a method of bringing together information about people, places and events in a way that protects individual privacy. Also known as data integration or data matching, there is an increasing demand for linking together data from multiple sources, driven by the potential data integration has to produce rich and dynamic datasets which can be used to yield insight in solving complex problems.</p> <p>Data integration allows better use of data that is already available, it can be a cost effective and timely way of gathering more information for statistical and research purposes.</p> <p>ACT Health is currently collaborating with the Australian Institute of Health and Welfare, the Commonwealth Department of Health and other state and territory health authorities to create a national de-identified dataset containing admitted patient services, emergency department services, and outpatient services along with Medicare Benefits Schedule and Pharmaceutical Benefits Scheme. This data will provide a greater insights into⁵:</p> <ul style="list-style-type: none"> • patterns of use and effectiveness of health and residential aged care services • quality and safety of services provided • health risks for particular patient cohorts • chronic disease management — patterns of service provision • validation of the current treatment pathways for chronic disease management and care • defining patient journeys and assessing efficiency and effectiveness of the health and residential aged care systems • safety and quality of hospital and other services, such as residential aged care services • accessibility and effectiveness of services contributing to the management of chronic conditions • policies and programs designed to reduce the incidence and severity of disease and injury.

Program of activities – immediate actions

The following table describes the immediate actions taken to address the System-Wide Data Review.

Table 28 Program of activities - immediate actions for the information and insights domain

D9 – Information and Insights	
Immediate actions (completed or underway)	D9.1 Consulted with external stakeholders to produce a schedule/register of mandatory reports to meet reporting obligations <ul style="list-style-type: none"> ✓ The new Reporting and Coordination Unit has communicated with the relevant external stakeholders to confirm reporting requirements and timeframes. ✓ A register of mandatory data requirements, including a reporting schedule for all internal and external requirements has been produced.
	D9.1 Identified essential internal and external reports such that mandatory reporting deadlines are being met more consistently <ul style="list-style-type: none"> ✓ The range of essential internal and external reports were identified, ceasing any reports that are not essential. ✓ Essential external report submission dates to the relevant agencies inform ACT Health's priorities for external reporting, see Appendix 3 for essential external reports identified. ✓ Agreed reporting timelines have been more consistently met.
	D9.2 Undertook a mapping exercise of existing ACT Health strategic and national mandatory report indicators <ul style="list-style-type: none"> ✓ A mapping exercise was undertaken of ACT Health strategic and national indicators in existing mandatory reports, against national standards to improve comparability and align with best practice.
	D9.6 Began reviewing and evolving the existing Activity Based Funding Framework <ul style="list-style-type: none"> ✓ Initial work has progressed to review, renew and evolve the Activity Based Funding Framework, including the development of a draft framework.
	D9.8 Commenced drafting the Measurement Framework to support the ACT Health Quality Strategy <ul style="list-style-type: none"> ✓ Initial work has progressed to draft the Performance Measurement Framework, this specifically relates to defining how quality is measured. Once finalised the framework will be rolled out to all clinical units to ensure they understand its application to their day-to-day work.
	D9.11 Commenced developing the Analytics Framework <ul style="list-style-type: none"> ✓ Initial work has progressed to draft the Analytics Framework.
	D9.12 Progressed discussions with the Australian Institute of Health and Welfare to collaborate with national data linkage processes <ul style="list-style-type: none"> ✓ Initial discussions with the Australian Institute of Health and Welfare have included compilation, provision and sharing of data.
Impact (of activities)	<ul style="list-style-type: none"> • Consensus view of reporting requirements, and will help to ensure ACT Health meets reporting timelines now and into the future. • Use data to drive improvements in clinical care and systems performance improvements.

Program of activities – recommended future activities

The following table describes the recommended future activities to achieve ACT Health’s Performance, Reporting and Data Management Vision over the next three years.

Table 29 Program of activities – future activities for the information and insights domain

D9 – Information and Insights		
Future activities (to be completed)	D9.5	Revise the Costing Framework <ul style="list-style-type: none"> ❖ The Costing Framework will specify a schedule for hospitals to submit costings; include a costing data specification; outline a costing review and validation process; and include an urgent issue escalation process.
	D9.6	Design and embed the Activity Based Funding Framework <ul style="list-style-type: none"> ❖ The Activity Based Funding Framework will identify the categories, classifications, issues and priority areas such that ACT Health can move towards Activity Based Funding.
	D9.7	Move towards automated costing and performance metrics <ul style="list-style-type: none"> ❖ Finalise the approach and pilot the automated costing and performance metrics for University of Canberra Hospital. Incorporate feedback where required.
	D9.9	Pilot implementation of automated standardised reporting functions <ul style="list-style-type: none"> ❖ Assess the options to automate standardised reporting functions allowing skilled analytics staff to use their time more efficiently on complex insight driven analytics.
	D9.10	Design new performance reports <ul style="list-style-type: none"> ❖ Design new operational performance reports for Activity Based Funding to inform clinical operations, costing and workforce.
	D9.11	Design and embed an Analytics Strategy including an Analytics Framework <ul style="list-style-type: none"> ❖ Once finalised, the Analytics Framework should be embedded into day-to-day operations. ❖ The Analytics Strategy will provide advanced analytics capability, and will include the pilot of a clinical analytics tool.
	D9.12	Establish the linkage of ACT Health data with national processes <ul style="list-style-type: none"> ❖ Establish the linkage of ACT Health data through collaborating with the Australian Institute of Health and Welfare.
	D9.13	Pilot, implement and review new performance reporting <ul style="list-style-type: none"> ❖ Pilot, implement and review a new performance reports based on external advice on best practice performance reporting metrics (links to D9.10).
	D9.14	Recommend new local strategic indicators using the Performance Measurement Framework <ul style="list-style-type: none"> ❖ Conduct a review of current indicators to provide a recommendation for new local strategic indicators.
	D9.15	Select and deploy a Business Intelligence tool and develop an associated Change Management Strategy <ul style="list-style-type: none"> ❖ Select and deploy a visual toolset and Business Intelligence platform.
D9.16	Continue automation of remaining standardised reporting functions <ul style="list-style-type: none"> ❖ Automation will allow skilled analytics staff to continue to use their time more efficiently on complex insight driven analytics. 	
Impact (of activities)		<ul style="list-style-type: none"> • More timely information will allow ACT Health to better assess performance relative to peers. • Frameworks will ensure consistency in performance assessment, reporting and analytics practices and guide ACT Health towards best practice in each of these areas. • Real-time analytics will support evidenced based decision-making. • The shift in focus of reporting on services and processes to patients, outcomes and experience will support the delivery of value based, patient centred care.

INFORMATION AND INSIGHTS FOR CONSUMERS

In the context of the System-Wide Data Review, consumer reporting refers to the delivery of public information to external stakeholders including the population of ACT Health, in particular patients and their families seeking real time information to make informed decisions about their healthcare.

Key findings

Whilst consumer information has been published in the past, there is more that could be done to ensure that the publication of data for consumers facilitates an improved understanding of ACT Health information including performance, quality and safety.

Terms of Reference

The System-Wide Data Review Terms of Reference specified the following outcome, which has been mapped to information and insights for consumers. A summary of the response to the Terms of Reference is provided in Appendix 1.

Table 30 Terms of Reference mapped to information and insights for consumers

Terms of Reference	
6.	Provide advice on the publication of data for consumers that facilitates improved understanding of ACT Health information, performance, quality and safety, including options for real-time provision.

Approach

To address the publication of data for consumers the following steps were taken, a summary of the analysis is outlined in Appendix 5.

1. Review the current state of available information for ACT Health.
2. Identify the type and quantity of data published by other state and territory health authorities as well as Commonwealth bodies.
3. Identify new development work underway across the ACT Health and nationally.

Program of activities

The following table details the immediate actions taken to develop ACT Health consumer reporting capability, and the recommended future activities that will be conducted to meet local consumer reporting requirements.

Table 31 Program of immediate actions and future activities for the information and insights consumer domain

D9 - Information and insights for consumers	
Immediate actions (completed or underway)	D9.3 Assessed the current state of published consumer data ✓ A review was conducted of the current state of consumer reporting including what is available and the method of delivery.
	D9.4 Liaising with the Healthcare Consumers Association to define their reporting requirements ✓ Discussions to date have concluded that an ongoing partnership will be formed to further develop and inform the consumer reporting requirements.
Future activities (to be completed)	D9.4 Identify options for improved consumer reporting ❖ Identify options and provide recommendations for consumer data availability and delivery.
	D9.17 Build functionality within the chosen ACT Health Business Intelligence tool to address the reporting needs of consumers
Impact (of activities)	<ul style="list-style-type: none"> • This will ensure that insightful information and analysis is available in a user friendly and timely manner for ACT Health consumers.

ROOT CAUSE ANALYSIS

Understanding the root cause of the data issues that were experienced in the past is key to ensuring they are not repeated in the future. An independent Root Cause Analysis was conducted to identify the underlying drivers of data issues, determine priority issues and develop recommendations for ACT Health going forward.

The Terms of Reference recognised the importance of conducting a Root Cause Analysis to understand what has happened in the past and why it may have occurred.

Terms of Reference

1. A summary of the extent, and where possible, the root cause of the current data issues.

The analysis found that the potential for data to inform clinical, operational and policy decisions was not being fully realised as a result of:

- Uncertainty over the quality of data
- A lack of access to timely data
- A lack of clarity on how to compare and interpret data
- A perception that not all the required data was being collected.

Root Cause Analysis process

The analysis was conducted using a five-step process which incorporated design thinking and root cause analysis methodologies.

1. **Document review.** Documents that detail the previous reviews on data issues and subsequent assessments of progress against recommendations were reviewed to inform the Root Cause Analysis key findings.
2. **High level maps of the data life-cycle.** Using information from the document review and meetings with key staff from ACT Health, Calvary Hospital and the Canberra Hospital, the data life-cycle was mapped for the ACT Patient Administration System (ACTPAS) and the Emergency Department Information System (EDIS).

The stages of the data life-cycle mapped were Collection, Validation, Warehousing, Reporting and Disposal. By developing high level maps of the data life-cycle, insights were gained into data issues.

3. **Root cause analysis workshops.** Workshops were held with a representative cross section of staff involved in the various stages of the data life-cycle and aimed to:
 - Understand the challenges faced by, and opportunities to improve the work

environment for people in various roles contributing to, maintaining and using ACT Health data

- Review the ACTPAS and the EDIS data life-cycle maps for accuracy, and discuss issues relevant to the key points in the data life-cycle
- Discuss the priority data issues, especially in the context of past reviews, to identify which issues are outstanding, and identify any residual gaps
- Use the five why's methodology which is a standard root cause analysis approach to determine systemic issues
- Develop priorities and recommendations to address the root causes and discuss what an ideal data system would resemble and aim to achieve
- Document what success would look like if data were effectively used by ACT Health in line with best practice data management

4. **Focused interviews with key stakeholders.**

Interviews with internal ACT Health stakeholders focused on:

- Identifying root causes of data issues
- Understanding the role of the stakeholder within ACT Health and the stakeholder's uses for data
- Understanding the concerns of the stakeholder relating to data issues, including identifying any outstanding issues
- Discussions of the key improvements the stakeholder would like to see to data, data systems and data use.

5. **Recommendation development.** The root causes of ACT Health's priority data issues were discussed at different points of stakeholder engagement and during project meetings.

To refine the list of recommendations and confirm that all the identified issues were addressed, a recommendation review workshop was conducted with subject matter experts in data governance and data management systems.

What was found, and recommendations going forward

There were four key themes to the findings and recommendations arising from the Root Cause Analysis, those being strategy, data and information and communications technology (ICT) governance, communication and collaboration, and change management.

A summary of the findings and recommendations are outlined in the table below. The program of work activity which addresses the recommendation has also been included.

Theme	Key findings	Recommendations	Core System-Wide Data Review activities to address recommendations (page 26)
Strategy	<ul style="list-style-type: none"> – The data activities across the directorate are not strategically aligned. – The digital health strategy, data strategy, and work force strategy are all in development. – There is a wide range of diverse systems (over 250 systems) in use across ACT Health, each with their own specific data definitions for each field. Further, there is evidence of duplication of data entry and system workarounds. – Current data activities have prioritised mandatory reporting requirements, which, while necessary, has resulted in not being ready for next generations technologies. – There is insufficient support for staff to meet their data training responsibilities. 	1. Align evolving data, digital health and workforce strategies	D6.2 Performance, Reporting and Data Management Strategy
		2. Invest in a single point of access to linked real time data	D1.3 New data repository business case D7.3 Performance, Reporting and Data SharePoint site and Intranet Portal
		3. Improve ICT system architecture to better support clinical workflows and information provision	D1.5 Upgrade systems including partnering and alignment with the ACT Health Digital Strategy
		4. Substantially reduce the number of systems collecting data	
		5. Implementation of the Performance, Reporting and Data Management Strategy when prioritising work and resources	D6.2 Performance, Reporting and Data Management Strategy – Implementation Plan
		6. Work with users of data across ACT Health and external stakeholders to take advantage of the broad range of data activities	D2.5 Data Management and Governance Framework
		7. Incorporate workforce strategy and roles into training design	D6.4 Performance, Reporting and Data training and orientation package D6.6 ACT Health data management training package
Data and ICT governance	<ul style="list-style-type: none"> – Data and systems governance processes are not coordinated, hindering data oversight and therefore not having the intended impact. – Governance structures, policies, standards and processes need better definition and communication. – Data definitions are not consistent across the organisation or consistent with national standards. – Processes do not support efficient data entry or use. 	8. Complete implementation of the Data Management and Governance Framework for ICT and data including application of data definitions consistent with national standards	D2.5 Data Management and Governance Framework D4. Metadata Management
		9. Conduct an assessment of data quality	D3.9 Data Quality Statements
		10. Perform an assessment of the ACT Government Protective Security Policy Framework to ensure compliance	D5.3 Perform an assessment of the ACT Government Protective Security Policy Framework to ensure compliance

Theme	Key findings	Recommendations	Core System-Wide Data Review activities to address recommendations (page 26)
	<ul style="list-style-type: none"> – Adherence to security and privacy policies has not been assessed. 		
Communication and collaboration	<ul style="list-style-type: none"> – The benefits of having quality data need to be better communicated. – Greater collaboration is required to disseminate best practices with regards to data entry, management and use. – Access to data expertise when requesting data for reports is not readily available in many areas. 	<ol style="list-style-type: none"> 11. Implement a communication plan for internal and external stakeholders 12. Communicate the confidence levels and limitations of data 	<p>D7.1 Communications strategy</p> <p>D3.9 Data quality statements D7.3 Performance, Reporting and Data SharePoint site and intranet portal D6.4 Performance, Reporting and Data training and orientation package D6.6 ACT Health data management training package</p>
Change management	<ul style="list-style-type: none"> – A formal change management methodology is required to ensure that internal and external stakeholders are aware of and understand changes made to data and processes. 	<ol style="list-style-type: none"> 13. Use a standard structure to support change management 14. Measure and share the impacts of changes with staff across ACT Health 	<p>D8.1 Change management process D8.2 Change Control Board</p> <p>D7.1 Communication Strategy D7.3 Performance, Reporting and Data SharePoint site and Intranet Portal</p>

ENDNOTES

¹ ACT Auditor-General's Office, Performance Audit Report, Emergency Department Performance Information, Report No. 6/2012, online link below: [http://www.audit.act.gov.au/auditreports/reports2012/Report%20No.%206%20Emergency Department Performance Information.pdf](http://www.audit.act.gov.au/auditreports/reports2012/Report%20No.%206%20Emergency%20Department%20Performance%20Information.pdf)

² ACT Government, ACT Health, Terms of Reference for the system-wide review of ACT Health data and reporting, online link below: <http://www.health.act.gov.au/sites/default/files/Terms%20of%20Reference%20for%20the%20system-wide%20review%20of%20ACT%20Health%20data%20and%20rep...%20%281%29.pdf>

³ Australian Government, Australian Digital Health Agency, Australian's National Digital Health Strategy, online link below: [https://www.digitalhealth.gov.au/about-the-agency/publications/australias-national-digital-health-strategy/ADHA-strategy-doc-\(2ndAug\).pdf](https://www.digitalhealth.gov.au/about-the-agency/publications/australias-national-digital-health-strategy/ADHA-strategy-doc-(2ndAug).pdf)

⁴ Organisation for Economic Co-operation and Development (OECD), Health Data Governance: Privacy, Monitoring and Research Policy Brief, online link: <http://www.oecd.org/health/health-systems/Health-Data-Governance-Policy-Brief.pdf>

⁵ Australian Institute of Health and Welfare (AIHW), The National Integrated Health Services Information (NIHSI) Analysis Asset (AA), online link: <https://www.aihw.gov.au/our-services/data-linkage/approved-aihw-linkage-projects>

APPENDICES



1. TERMS OF REFERENCE OF THE SYSTEM-WIDE DATA REVIEW

Outlined below are the Terms of Reference as tabled in the ACT Legislative Assembly on 28 March 2017. A key action response has been included to describe the immediate actions taken or recommended future activities planned to address each of the Terms of Reference.

Table 32 Response to the Terms of Reference of the System-Wide Data Review

Terms of Reference	Due	Response
1. A summary of the extent, and where possible, the root cause of the current data issues	September 2017	✓ An independent root cause analysis (RCA) was undertaken. The recommendations from the RCA have assisted in finalising the scope of the activities in the Performance, Reporting and Data Management Strategy.
2. Establish revised governance processes and protocols for data management, reporting and analysis. Features of these processes and protocols will include:		✓ See below.
2.1 Defined work schedules and steps for key reporting obligations	June 2017	<ul style="list-style-type: none"> ✓ There was significant work to consolidate the vast quantum of existing reports produced across ACT Health. ✓ A list of mandatory external reporting obligations were developed in consultation with external agencies, with a similar process for internal stakeholders. ✓ Key activities for work schedules were defined including scheduling of activities to ensure timeframes were met.
2.2 Formalised change processes for source systems, datasets and data queries to ensure that the impact of changes to any source systems are identified and addressed within the datasets	June 2017	<ul style="list-style-type: none"> ✓ A formalised change management process has been developed to ensure all data changes are managed and approved appropriately. ✓ Changes are categorised into one of five classifications: <ul style="list-style-type: none"> - Metadata (technical and functional) - Outputs (report or submission) - Extraction Processes - Source System Changes - Business/Operational Changes (ward/clinic). ✓ Resources allocated to the Change Management process include managing the establishment of a new Change Control Board. The Change Control Board will have oversight and approve all system and data changes moving forward.
2.3 Clear delineation of responsibility for managing different stages of the extraction, transformation and reporting and analysis of data	March 2018	✓ A roles and responsibilities matrix for data management was defined to provide clear lines of responsibility across the data management life cycle.

Terms of Reference		Due	Response
2.4	Clearly defined quality assurance and clearance steps for all data reporting and analysis	March 2018	✓ Data quality assurance processes have been reviewed and refined across the data life cycle phases.
<i>In parallel with the determination of a framework for the rebuilding of the ACT Health data warehouse, reporting and analysis systems and functions will include:</i>			
2.5	Appropriate access controls and audit information for all data sets	March 2018	✓ The Framework includes a system management zone that defines how the system is secured, access provisions and provides user and service monitoring capabilities.
2.6	Establishing standardised queries for reporting purposes that are to be used at all times for report generation	March 2018	✓ The Framework for the Operational Data Hub provides tools to consistently produce curated data sets for consumption both internally and externally to ACT Health.
2.7	Establish a framework for publication of datasets for each time period	March 2018	✓ The Framework for the Operational Data Hub provides tools to consistently produce curated data sets for consumption both internally and externally to ACT Health.
3.	Develop a Framework for the provision of essential data reports derived directly from source systems as an interim process. This will ensure that ACT Health internal and external reporting requirements can be maintained and will comprise of:		✓ See below.
3.1	Identifying the range of essential internal and external reports, and ceasing any reports that are not essential	June 2017	<ul style="list-style-type: none"> ✓ A list of mandatory external reporting obligations were developed in consultation with external agencies, with a similar process for internal stakeholders. ✓ A number of automated reports were continued for operational purposes. These reports have continued unless there were technical issues, and then each report was assessed individually to understand the impact on operations prior to ceasing any reports.
3.2	Confirming the priority order and timeframes for external reporting	June 2017	<ul style="list-style-type: none"> ✓ Due dates for all data submissions were agreed with external agencies to ensure each report could be prioritised. ✓ A program of work has been embedded to ensure compliance with external reporting obligations.
3.3	Mapping the data definitions against the source systems to identify the systems required to generate reports	June 2017	✓ Data definitions have been mapped against reports that are derived directly from source systems. This work will be ongoing as the data repository is rolled out and work commences with the Australian Institute of Health and Welfare to use their online data registry for all definitions and standards.
3.4	Replicating systems for reporting purposes and writing queries to generate reports from the replicated data	June 2017	<ul style="list-style-type: none"> ✓ Identification of source systems for replication commenced and has been undertaken in accordance with the essential internal and external reporting priorities. This work contributed to defining the technical specifications of the interim data holdings for the production of reports. ✓ Further to the technical specification, an understanding of the structure and relationships (including business processes) of source system data allowed for the mapping of report elements to source systems and implementation of extract, transform and load (ETL) processes to populate the required data elements. The output of these processes are validated against the replication to ensure all appropriate events have been captured.

Terms of Reference	Due	Response
		<ul style="list-style-type: none"> ✓ Documentation has been developed with data definitions aligned with each data set to inform a data dictionary and register of reports. These definitions include calculation methodologies in alignment with national definitions and common aggregation points. The reporting data sets are quality assured against the data definitions and calculation methodologies. Further data validation steps are undertaken to ensure that the data is internally consistent and logical. ✓ Queries are written against the reporting data sets according to the business requirements for individual reports and checked against the coding standards for compliance. The queries result in the production of the reports.
3. Replacement of the ACT Health data warehouse, reporting and analysis systems and functions. This will include how we propose to:		✓ See below.
3.5 Reconstruct the warehouse to ensure that it accurately extracts and transforms data from source systems	September 2017	✓ The establishment of a Data repository and reporting hub provides repeatable ETL/ELT capabilities and data lineage to trace back to source systems.
3.6 Deliver and publish datasets for each time period	September 2017	✓ The Framework for the Operational Data Hub provides tools to consistently produce curated data sets for consumption both internally and externally to ACT Health.
3.7 Develop Application Programming Interfaces (APIs) to publish data in real-time for required data sets (such as Emergency Department waiting times)	September 2017	✓ The Framework of the Operational Data Hub provides capabilities to support APIs and tools to provide real time data to feed outputs like the Emergency Department waiting times.
3.8 Integrate relevant de-identified data into the ACT Government Data Lake	September 2017	✓ The Framework for the Operational Data Hub provides tools to produce appropriate data sets for the Territory's whole of Government Data Lake.
3.9 Re-write the data queries required to accurately generate reports	September 2017	✓ The establishment of a Data repository and reporting hub provides repeatable ETL/ELT (extract transform load/extract load transform) capabilities and all queries will be rewritten against business processes and rules in this new capability.
4. Implementation of all Framework outcomes	March 2017	✓ A number of frameworks were developed to guide the activities of System-Wide Data Review.
5. Provide a detailed roadmap to address existing recommendations from the Auditor-General and ACT Health external advisers. This will comprise of:		✓ See below.
5.1 A single report outlining all recommendations	September 2017	<ul style="list-style-type: none"> ✓ In June 2017, ACT Health Directorate's Internal Audit team engaged a suitably experienced internal audit service provider to conduct an independent assessment of the 175 data integrity recommendations resulting from reviews over the period 2012 to 2016. ✓ The recommendations from the external reviewers were consolidated into a single report and have been used as the basis of the independent audit reviews.

Terms of Reference	Due	Response	
5.2 ACT Health's acceptance, or not, of each recommendation	September 2017	✓	<p>Each recommendation was reviewed by ACT Health and the acceptance, or not has been identified. Seven recommendations were classified as 'Not Accepted' and these relate to recommendations that:</p> <ul style="list-style-type: none"> - were not accepted at the time - are no longer relevant or superseded by the System-Wide Data Review, or - are not relevant to the System-Wide Data Review and should be dealt with more broadly.
5.3 Prioritisation of each recommendation, including an estimated date of completion	September 2017	✓	Each recommendation was prioritised and the estimated date of completion allocated upon commencement of the independent audit assessment.
5.4 A report detailing progress status against each recommendation	September 2017	✓	<p>The independent audit assessment was conducted in four phases, with the first phase allowing for a baseline of the status of the recommendations to be established. The next three phases occurred in September 2017, December 2017 and March 2018 with an update of the progress made and validation of the effectiveness of implementation of the recommendations.</p> <p>✓ The audit process included meeting with a range of staff across ACT Health and each recommendation was updated based on information obtained and provided from staff during these meetings.</p> <p>✓ Refinement of the categorisation of the recommendations based on the Informatics Strategy domains (i.e. data management, performance reporting, security and privacy, communication, workforce, metadata, governance, change management and quality) was also performed by the Independent Auditor.</p>
6. Provide advice on the publication of data for consumers that facilitates improved understanding of ACT Health information, performance, quality and safety, including options for real-time provision.	September 2017	✓	<p>ACT Health are partnering with the Health Care Consumers Association and have agreed this is a journey of continual improvement that is enduring and not a one off solution. To date current work has included:</p> <ul style="list-style-type: none"> - Reviewed the current state of information currently published by ACT Health - Reviewed other states and territories and Commonwealth agencies for the quantity and type of data published - Considered local and national work including a Measurement Framework to support the ACT Health Quality Strategy 2018-2028 and the new Australian Health Performance Reporting Framework - Reviewed three external reports to ensure any new proposed metrics are aligned with local policy issues - Seeking external independent advice regarding best practice leading performance measures - Liaising with the Health Care Consumers Association to define their reporting requirements for Health Information and Insights including exploring options for best practice technology to access the data.

2. RECOMMENDATIONS FROM EXTERNAL REVIEWS

As outlined on page 9, an independent, specialist external auditor was engaged by ACT Health to conduct a progressive assessment of the effectiveness of progress made against the implementation of the 175 recommendations over the System-Wide Data Review period. The final status (as at 31 March 2018) of the progress of the recommendations is included in the table below.

Table 33 175 Recommendations from external reviews - Progress summary as at March 2018

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
1	PwC 2016	Design, develop and implement Data Management and Governance Framework for ACT Health.	Data governance	Ongoing
2	PwC 2016	Embed a Data Management and Governance Framework , that should include at least: <ul style="list-style-type: none"> a) defining the ownership and accountabilities for data and reporting. This should include appointing an individual with the key accountability for the definition and oversight for data and information governance; b) building and implementing the data management and governance model supporting the data owner(s); c) defining the data quality requirements of all stakeholders reliant on Performance, Reporting and Data function reporting (previously Business Performance Information Decision Support (BPIDS)); and d) performing ongoing quality assurance and testing of the data warehouse. This should include ensuring that changes to business processes can be identified to understand the impact on data holdings and underlying calculations. 	Data governance	Ongoing
3	ACT Assembly Standing Committee 2015	The Committee recommends that robust data validation processes be established for the Canberra Hospital and that the Government of the day report to the ACT Legislative Assembly on the first sitting day of 2013 on their implementation.	Data governance	Ongoing
4	ACT Auditor-General 2015	Validation Processes: The Health Directorate should develop and implement overarching policies and procedures related to data validation processes and activities. These should provide a consistent framework that is flexible and adaptable when needed to reflect local processes and organisation structure.	Data governance	Ongoing
5	Marshall 2013-2015	Principles and conditions of data access: that the governance arrangements for Health Directorate data holdings should include a statement of high level principles and general rules that apply to all data holdings.	Data governance	Underway
6	Reid 2012	There should be a Directorate wide suite of Standards, Standard Operating Procedures and Training modules required to be adopted for all data management.	Data governance	Underway
7	Reid 2012	The ED P&I Branch should be included in the list of data custodians within various legislative and data policy documents.	Data governance	Underway
8	Reid 2012	Information management issues should be a regular agenda item for discussions by the ICT Management Committee . The Terms of Reference and membership of this committee will need to be reviewed in light of this broadened scope.	Data governance	Completed

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
9	Reid 2012	As a general rule, Data Managers and Business Information Managers should be employed as out-posted officers of the P&I Branch.	Workforce	No longer relevant
10	Reid 2012	There should be a regular newsletter from P&I Branch to interested people within the Directorate on initiatives in information management with a particular focus on implementation of Activity Based Funding .	Change management	Underway
11	PwC 2016	Develop and implement a formal Change Control Process for amendments to the Report (Annual and Quarterly Performance Reports), including: a) Change Request Template to capture changes requested; and b) Change Request Register to capture date and origin of change requested.	Change management	Underway
12	PwC 2016	Develop Governance Assurance Framework for BPIDS Reporting Function.	Data governance	Underway
13	PwC 2016	Develop Implementation Plan for the Governance Assurance Framework for BPIDS Reporting Function. (This will incorporate the 'Reporting Program of Work' mapping activity).	Data governance	Underway
14	PwC 2016	Reporting Program of Work – mapping of the reporting environment (source to reports to stakeholders) and development of a 'risk heat map' based on current known issues with report processes (including SQL and Extract Load Transform errors).	Information and insights	Underway
15	PwC 2016	Develop procedural documentation for the end-to-end report creation process, including clear roles and responsibilities in alignment to the requirements definitions. Develop a formal approvals process for provisioning access to subscription reporting, in particular for those which report sensitive data. Develop a periodic review process for automated routine reporting, which re-assesses design appropriateness against requirements definitions, identifies any updates to content required due to organisational changes or similar, and considers reports that are no longer required and can be decommissioned.	Data governance	Underway
16	PwC 2016	Develop and implement a formal Change Control Process applicable to the provisioned reports and associated SQL/business logic.	Change management	Underway
17	PwC 2016	Undertake full review of BPIDS response to Auditor-General Recommendations .	Data governance	Completed
18	ACT Auditor-General 2015	Change Management: As the Health Directorate implements its Information Management Strategy 2015-2016, change management activities should include: a) training Health Directorate and hospital staff to ensure they have an adequate understanding of the Strategy and specifically data integrity activities; and b) documenting and allocating responsibility for data integrity activities for the key systems, including ACT PAS, EDIS and the Health Directorate data warehouse.	Change management	Completed

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
19	ACT Assembly Standing Committee 2015	The Committee recommends that the Government of the day detail to the ACT Legislative Assembly, at the earliest possible opportunity, what action the Health Directorate has taken to assess whether a prevailing organisational culture at the Canberra Hospital contributed to the circumstances surrounding the alteration and misreporting of performance information.	Data governance	Completed
20	ACT Assembly Standing Committee 2015	The Committee recommends that clear guidelines be established concerning internal communication between the ACT Health Directorate, the Canberra Hospital and Calvary Public Hospital.	Change management	Completed
21	ACT Assembly Standing Committee 2015	The Committee recommends that clear guidelines be established concerning external communication regarding matters concerning the ACT Health Directorate, the Canberra Hospital and Calvary Public Hospital.	Data governance	Completed
22	ACT Auditor-General 2012	The Health Directorate and Calvary Public Hospital should develop essential EDIS governance documentation , including: <ul style="list-style-type: none"> a) an overarching governance statement that describes: <ul style="list-style-type: none"> i. the purpose and use of the system; ii. its business owner, system administrator and all roles and responsibilities associated with the system and its support (including third party stakeholders such as Shared Services ICT); iii. the security classification of the system and its data; iv. applicable policy and administrative guidance; v. record-keeping obligations; vi. training requirements; and vii. what is monitored and audited to ensure compliance with policy and supporting system documentation. b) standard operating procedures for all roles and responsibilities associated with the system and its use; c) training material that covers all dimensions of EDIS including user roles and responsibilities, processes described in standard operating procedures and specific policy that is applicable to the system; and d) a System Security Plan, which is informed by a risk assessment and risk management plan. 	Data governance	Completed
23	ACT Auditor-General 2012	The Health Directorate and Calvary Public Hospital should: <ul style="list-style-type: none"> a) review the current distribution of access to EDIS throughout the hospital and remove any users who do not have a specific and documented requirement for access to the system; and b) develop policies, administrative procedures and system controls (if possible) that restrict the use of generic user accounts outside the Emergency Department work environment. 	Data security and privacy	Completed

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
24	ACT Auditor-General 2012	The Health Directorate and Calvary Public Hospital should: a) identify and document responsibilities for user access management and log monitoring for EDIS ; and b) develop a process to monitor user activity within EDIS and how to report and escalate unusual activity to the appropriate authorities.	Data security and privacy	Completed
25	ACT Auditor-General 2012	The Health Directorate should develop policy and administrative guidance for EDIS data validation activities for the two Canberra hospitals. The policy and administrative guidance should identify and document: a) agreed Emergency Department actions which constitute 'clock starting' and 'clock stopping' moments for the purpose of EDIS timeliness records; and b) protocols for data validation activities in the day(s) following a patient's presentation to the Emergency Department.	Data governance	Completed
26	ACT Auditor-General 2012	The Health Directorate should implement additional review and assurance controls over the preparation and reporting of Emergency Department timeliness performance information . These review and assurance controls should address both Canberra Hospital and Calvary Public Hospital performance information. The Health Directorate should consider whether the additional review and assurance controls should be applied to other performance information.	Data quality	Completed
27	ACT Auditor-General 2015	Patient Record Close Period: a) Calvary Public Hospital should align its EDIS record close period (i.e. the period after which records are locked) with that of Canberra Hospital. b) The Health Directorate should undertake a monthly assessment to monitor changes to patient records after the close period.	Data quality	Completed
28	ACT Auditor-General 2015	Training Materials: Canberra Hospital should finalise its draft EDIS training documents and implement a mandatory requirement for staff to complete EDIS training before receiving access to the system.	Workforce	Completed
29	ACT Auditor-General 2015	Reporting of Activity Based Funding Costing Data: The Health Directorate should develop and publish a costing framework which: a) allocates roles and responsibilities between the Health Directorate and hospitals; b) specifies a firm schedule for hospitals to submit costings; c) incorporates a costing data specification; d) outlines a costing review and validation process; and e) includes an urgent issue escalation process.	Information and insights	Completed
30	ACT Auditor-General 2015	Clinical Coding: Canberra Hospital and Calvary Public Hospital should improve their clinical coding with the following process changes. a) Where coding is completed before the availability of the discharge summary, the medical record should be flagged, to facilitate subsequent identification of potentially incorrectly coded episodes. b) Where the discharge summary directly conflicts with information in the record, a query should be forwarded to the treating clinician for clarification. These queries should be followed-up and documented for future reference.	Data quality	Completed
31	Marshall 2013-2015	Registers be established and maintained of reports issued and data holdings maintained and that these registers be developed as the key control mechanism for the report release authorisation and recording process.	Data governance	Completed

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
32	PwC 2016	Develop and agree requirements definitions for automated routine reports . This is to include identification of a relevant business report owner.	Information and insights	Underway
33	Marshall 2013-2015	A record of reports issued and data sources : that a register of statistical and management reports (Register of Reporting (RoR)) be prepared and maintained by P&I Branch from monthly returns from each of the areas using and analysing data.	Data governance	Completed
34	Marshall 2013-2015	Operational information systems that generate data and reports : that the example list of source systems and data holdings be replaced by a systematically maintained Register of Operational Data Stores. This should be then used as a standard reference point to identify source data used in reports and data extract cover sheets.	Data governance	Underway
35	Marshall 2013-2015	Data custodians and recording of data releases : that a responsible custodian is identified for each data holding – and levels of delegation for release specified in the Register of Reporting.	Data governance	Underway
36	Marshall 2013-2015	Data custodians and recording of data releases : that a specified subject matter expert is identified for each data holding who has a defined role in its management.	Data governance	Underway
37	Marshall 2013-2015	Data custodians and recording of data releases : that an auditable register be maintained of standards applicable to each data holding – dates of implementation and updates to the standards. These standards and policies should include metadata specifications, release policies and procedures, access policies and register, security arrangements and audit documentation.	Data governance	Underway
38	Marshall 2013-2015	Data custodians and recording of data releases : that each data holding is classified according to its level of access and level and category of risk.	Data governance	Underway
39	Marshall 2013-2015	Report credentialing and conditions of release : that the Register of Reports also identify the responsible data custodian by position for each of the datasets and link to standard documentation of standard conditions of release of the dataset, subsets or reports.	Data governance	Underway
40	Marshall 2013-2015	Data audit status and metadata standards : that for each of the systems in the Register of Reports, the audit status of system access and the security of record change history system functions and supervision be identified and updated when audit actions are scheduled and completed.	Data governance	Underway
41	Marshall 2013-2015	Identification of report authorship and underpinning data status : that the register record responsible management points from source to analytical output for each periodic report.	Data governance	Underway
42	Reid 2012	A register of all Directorate external data provision should be developed and maintained.	Data governance	Completed
43	Marshall 2013-2015	Office of Data Integrity be established and supported by direct report senior executive on progress with implementation of the recommended building blocks and provide a focal point for receiving and follow up of data integrity concerns.	Data quality	No longer relevant
44	Marshall 2013-2015	The Office of Data Integrity : that the Data Integrity Adviser position be staffed as soon as possible and the Office of Data Integrity be tasked with the priority function of delivering a three year external audit program as well as ongoing responsibility for risk assessment and support for professionalism in health information management and data recording in particular.	Data quality	No longer relevant

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
45	Marshall 2013-2015	The Office of Data Integrity: that the Data Integrity Adviser be asked to report annually on progress with implementation of those elements of this Data Integrity Strategy that are agreed by the Health Directorate Executive.	Data quality	No longer relevant
46	Marshall 2013-2015	Health information professionalism: that on recruitment to data management and analysis positions, qualifications and/or practical experience should be sought according to role in skills areas such as: (a) health informatics, (b) health information system analysis (c) health information management (d) epidemiology, (e) health econometrics, (f) health statistics, (g) Casemix/ABF, (h) health classifications, (i) clinical costing.	Workforce	Ongoing
47	Marshall 2013-2015	Health information professionalism: that current staff should be encouraged and facilitated in attending continuing professional education forums – extension courses symposia and conferences in the above fields.	Workforce	Ongoing
48	Reid 2012	An assessment of the skills and competencies of people involved in data management and dissemination should be undertaken. Targeted education and training should be provided to accommodate identified skills deficiencies.	Data management	Ongoing
49	Marshall 2013-2015	Data qualifications and disclaimers: that the data qualification categories listed in IHPA's Data Integrity Framework be incorporated by the ACT Health Directorate into the RoR notations at least in the early stages of IHPA reporting routines. Once these thresholds become historic, finer thresholds for qualification and disclaimers that identify confidence levels in data precision and rigor would and should almost certainly be introduced.	Data quality	No longer relevant
50	PwC 2016	Create a data management strategy and roadmap . This document should define responsibilities for data management, information management and reporting. It should reflect the current state and desired state architectures and provide a roadmap (and a budget) to facilitate the required improvement in maturity. The strategy should define the role of source systems, reporting databases and the data warehouse, and should define the high level business requirements and metrics proposed to assess the strategy's implementation.	Data management	Underway
51	PwC 2016	Define the architecture to support development of a roadmap that can prioritise what reporting is performed and the systems required. This will require maturing any existing Enterprise Architecture (EA) documentation, which should include the business architecture, technical architecture, data architecture and application architecture. This will also require management agreement of the desired end state for data management and reporting (that should consider both benefits and costs).	Information and insights	Underway
52	ACT Auditor-General 2015	Non-Admitted Patient Data and Systems: The Health Directorate should implement a single patient management system, and standardise data management policies and procedures, across all public outpatient clinics.	Data management	Underway
53	ACT Auditor-General 2012	The Health Directorate should: a) review the current EDIS upgrade project and link it with current Health Directorate Identity and Access Management and Rapid Sign-On initiatives that are currently underway, to allow staff to be individually accountable for their actions; and b) review all available Emergency Department software to evaluate whether or not the current EDIS should be replaced with one that has strong confidentiality and integrity controls as well as appropriate process linkages.	Data management	Underway

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
54	ACT Assembly Standing Committee 2015	The Committee recommends that, consistent with the recommendation of the Auditor-General, the rapid sign-on system be implemented as soon as practicable and that the Government of the day report to the ACT Legislative Assembly at the earliest opportunity on its implementation.	Data management	Completed
55	Marshall 2013-2015	<p>Data repositories: that the concept of a ‘one source of truth’ data repository for management data access be clarified in terms of:</p> <ul style="list-style-type: none"> a) data holdings design: particularly extraction and transformation points and points at which automated and manual coding, ETL, storage, processing and aggregation occur. b) data provenance: particularly the level of detail summarisation at each stage of case or unit of activity bundling and classification; c) development of reporting requirements and level of data abstraction; d) capacity and data quality assurance protocols for reconciling and replicating important counts and measures with original source records in operational and business systems; e) audit requirements and audit plans for reports and data extracts against source records or other evidence f) mapping of historical data to current dataset versions to permit longitudinal comparative analysis. 	Data management	Underway
56	Reid 2012	The timeframe and scope of data inputs to the data repository needs urgent clarification.	Data management	Underway
57	PwC 2016	Develop new data warehouse .	Data management	Underway

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
58	PWC 2016	<p>Design and build the data warehouse, which should include:</p> <ul style="list-style-type: none"> a) understanding the range of existing source information systems (and supporting source databases) and agreed sources of truth for each data type; b) defining the detailed business reporting requirements of each branch, including the level of business intelligence and analytics required; c) defining the detailed business reporting requirements of each branch, including the level of business intelligence and analytics required; d) designing a data model aligned to the data architecture and agreed naming conventions; e) creating a technical design that incorporates the platform, capacity and performance requirements, indexation, user access, change management etc.; f) defining the required data transformation services, including ETL from source systems; g) testing the build to ensure business logic is correctly applied when reporting from the warehouse. This will require the design and test teams having access to key business process documentation for source systems (including EDIS and ACTPAS) to define and review business logic in place. Ensure changes to business processes can be identified to understand the impact on data holdings and underlying calculations; and h) decommissioning of existing data warehouse databases that will no longer be required. 	Data management	Underway
59	PWC 2016	Consider introducing new technologies .	Data management	Completed
60	PWC 2016	<p>Undertake an assessment of the application of emerging data technologies for ACT Health. For example, data virtualisation tools would allow dynamic usage of data from multiple source systems for ad-hoc reporting. This would allow limiting the data warehouse to key required fields, and additional fields only used occasionally would not need to be stored in the data warehouse.</p> <p>A separate category of data management tool covers data visualisation. ACT Health are not currently leveraging these tools for most reports, which could improve the efficiency of report generation and the impact that reports have on different stakeholders.</p>	Data management	Ongoing
61	Marshall 2013-2015	<p>Help desks: that within CIOs Branch, a help desk be set up for ICT systems operation queries. In particular the functions of the SSICT help desk should be reviewed in relation to the IM help desk to ensure there are no gaps. The core functions of the system help desk should include;</p> <ul style="list-style-type: none"> a) system components operation (system performance review, system development and integration, system provider management – including shared services) b) system access registration and c) system login tracking security monitoring and d) system access audits. 	Communication	Completed

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
62	ACT Auditor-General 2015	Audit Logs: Both Canberra Hospital and Calvary Public Hospital should establish useable audit logs for EDIS to allow monitoring activities after the close off period. The audit logs should be reviewed regularly, with results presented to the accountable hospital executives and to the Health Directorate.	Data quality	Underway
63	Marshall 2013-2015	Principles and conditions of data access: that general rules and specific rules for particular data holdings be: a) readily available to users and b) linked to the system access points c) acknowledged by users at the point of use as part of the access procedure. (In the same way as conditions of issue of airline tickets – or acknowledgement of license conditions before loading software).	Data security and privacy	Completed
64	Marshall 2013-2015	Principles and conditions of data access: that the eHealth strategy provisions for data holdings management be expanded and promulgated to staff both as: a) general topic manuals with rules applicable across all data holdings and b) specific purpose documents associated with each data holding.	Data management	Underway
65	Marshall 2013-2015	Principles and conditions of data access: that changes in the specification, standards or provisions of access to any data holding be: a) promulgated to registered users b) listed in a running bulletin at a central web location c) maintained in documentation associated with the data holding.	Data security and privacy	Underway
66	Marshall 2013-2015	Data systems security management: that system access profiles be developed for each staff category and clinical role where use of records systems is required. That system logons be refined to facilitate access for authorised personnel and restrict access to unauthorised personnel.	Data security and privacy	Completed
67	Marshall 2013-2015	Data system security management: that a register of (people) authorised to access data holdings in the systems be established for each operational system and level of access for each authorised person be specified – role, data entry – data correction –and data deletion.	Data security and privacy	Completed
68	Marshall 2013-2015	Data system security management: that for all databases, a system be enabled to log and register: a) history of database access and b) history of record search, record extraction, record entry, record completion and record change action and reasons for change.	Data security and privacy	Underway
69	Marshall 2013-2015	Data system security management: that for data entry and system management staff similar logon authorisation management and data access logs be maintained as for other system users be maintained.	Data security and privacy	Completed
70	ACT Assembly Standing Committee 2015	The Committee recommends that the Government of the day review the security of information which identifies individual patients at the Canberra Hospital and report on the outcomes of this review to the ACT Legislative Assembly on the first sitting day of 2013.	Data security and privacy	Completed

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
71	ACT Assembly Standing Committee 2015	The Committee recommends that all ACT Government directorates and agencies should prioritise as a matter of urgency an assessment of the adequacy of controls over their respective IT systems and applications. This should include consideration of the controls that affect the reliability of all IT systems and applications (general controls) and controls that are specific to each application (application controls).	Data security and privacy	Completed
72	ACT Assembly Standing Committee 2015	The Committee recommends that the Commissioner for Public Administration, in consultation with ACT Government directorates and agencies, develop a whole-of-government policy for the management of private information relating to ACT Public Service employees and recipients of ACT Government services.	Data security and privacy	No longer relevant
73	Marshall 2013-2015	Principles and conditions of data access: that a program of review of data access arrangements be developed so that each data holding is covered at least once each year or according to risk rating.	Data security and privacy	Completed
74	PWC 2016	Review and update access controls to Shared Network Drive for PI (Report Template) and DSS (Report Proof).	Data security and privacy	Completed
75	PWC 2016	Apply access controls to the SQL query and the Excel file used to populate the Surgeon Wait Times public report.	Data security and privacy	No longer relevant
76	PWC 2016	Reduce levels of 'write' access to report files (.rdl files), to include only the data team who actively manage the reports.	Data security and privacy	Underway
77	PWC 2016	Apply PwC's SQL fixes to MORBID and continue to use MORBID.	Data management	No longer relevant
78	PWC 2016	Apply PwC's SQL fixes to MORBID and continue to use MORBID in the short term for external reporting.	Data management	No longer relevant
79	Marshall 2013-2015	Data system security management: that regular audits of access be conducted and unusual patterns of access – particularly systematic record change be reviewed and/or investigated.	Data security and privacy	Ongoing
80	Marshall 2013-2015	Data access management: that access registers be analysed on a regular basis to identify systematic patterns of access to data records for change or update.	Data security and privacy	Completed
81	Marshall 2013-2015	Data access management: that annual audit programs include a review of access registers and investigation of atypical systematic access patterns.	Data security and privacy	Ongoing
82	Marshall 2013-2015	Training in values and best practice in data security: that data entry and data review staff be trained in the ethics of data security.	Workforce	Ongoing

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
83	Marshall 2013-2015	<p>Training in values and best practice in data security: that data entry and data review staff are provided on a regular basis with feedback for their checking and confirmation on:</p> <p>a) Patterns of data access with reasons.</p> <p>b) Results of data validation and QA on the data that they have entered or accessed for further action.</p> <p>The purposes for this include ensuring that all staff can be held responsible for their own logons and that possible false logons are identified quickly.</p>	Workforce	Completed
84	Marshall 2013-2015	Training in values and best practice in data security: that staff with discrepant levels of validation or edit queries be provided with further training or guidance.	Workforce	Completed
85	ACT Auditor-General 2012	The Director-General of the Health Directorate and the ACTPS Head of Service note the findings of this report (ACT Auditor-General's Report No. 6/2012: Emergency Department Performance Information) with respect to the executive who has admitted to manipulating hospital records, and consider whether this executive has engaged in misconduct in breach of section 9 of the Public Sector Management Act 1994 and their executive contract.	Data governance	Completed
86	ACT Auditor-General 2012	The Health Directorate reinforce to Health Directorate employees, especially executive staff, the need to act with integrity with respect to the maintenance of health records and associated data.	Data quality	Completed
87	ACT Assembly Standing Committee 2015	The Committee recommends that, given the Health Directorate's failure to protect the privacy of the Executive who admitted to altering data—prior to any civil, criminal or administrative proceedings—the Health Directorate should: (i) issue a public apology to the individual concerned; and (ii) take appropriate steps to acknowledge the individual's contributions to the operation and administration of the Canberra Hospital.	Data governance	Completed
88	Marshall 2013-2015	Data access management: that as staff leave positions or move from role to role, access authorisations be automatically removed and reinstated as appropriate.	Data security and privacy	No longer relevant
89	PWC 2016	Undertake a full Data Warehouse reconciliation and integrity validation check against source systems. This will include business and technical confirmation of data alignment.	Data management	Underway
90	PWC 2016	Identify appropriate additional resource/s who will require 'run' access to support current single resource for CHARM.	Data management	Completed
91	Marshall 2013-2015	Operational information systems that generate data and reports: that system development plans for any business system component include a comprehensive schedule of interfaces and tabulation of the interface metadata references and particulars.	Data management	Completed
92	ACT Auditor-General 2015	Define Activity Based Funding Related Data Mapping: Health Directorate should develop an Emergency Department Data Dictionary to standardise the definition of ABF-related data and define ABF-related data mapping from EDIS in both hospitals to the data warehouse.	Metadata management	No longer relevant
93	ACT Auditor-General 2015	Risk Based Approach to Investigations: As a priority, the Health Directorate should review the mapping processes used to extract data from EDIS to the data warehouse, and ensure that Admitted Patient principal diagnosis and Emergency Department type of visit are mapped appropriately.	Data management	Underway

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
94	Marshall 2013-2015	Operational information systems that generate data and reports: that mapping tables used at each interface between business system components be maintained in a register that links to the metadata data registry standards for each end of the map so that each time the standards are revised the interfaces to be updated will be identified and flagged.	Data management	Underway
95	Marshall 2013-2015	<p>A record of reports issued and data sources: that each six months, a regular stock of data holdings take be conducted by web portal with data analysts/data managers. By area of data system operation/function and also a sample of key data users/dataset holders who create reports and secondary datasets. The surveys would ask four sets of questions outlined below, for six-monthly updates for the register of data reports and data holdings including:</p> <ol style="list-style-type: none"> What reports and data release provision are you responsible for? To whom? For what purpose? Who/what is the official point/authority for release of the reports/datasets? Date of releases in past six months – Date of next scheduled/expected release. What are the data sources for the reports/data releases? Source records? Compiled datasets? Working datasets? – Date of releases in past six months – Date of next scheduled/expected release. What data holdings do you maintain? How are they stored? Who has access? Under what conditions? What records are there of data release? What is the audit trail from final reports to source records for the data used? – a. Standards and protocols? – b. Compliance assurance/audits? – c. Date of next scheduled audit or review? <p>To minimise repetition, the survey forms can be prepopulated with answers from the previous returns and only require confirmation updating that ideally would be done dynamically as reports and datasets are authorised for release. The survey that would then function as a follow up check and periodic stock take mechanism. Prepopulation could include:</p> <ol style="list-style-type: none"> Reporting obligation under which report was prepared Purpose of the report Key users of the report Data sources and working datasets from which report compiled. 	Information and insights	Completed
96	Marshall 2013-2015	<p>A record of reports issued and data sources: that this register be published via intranet web page in sections with hyper-links or references that identify those reports and data which are for:</p> <ol style="list-style-type: none"> public access by sale, publication, library or open internet lookup. limited public access by registration or fee by restricted access internet (e.g. registration and logon and conditions of access apply). ministerial and corporate access by intranet only. 	Data governance	Underway
97	Marshall 2013-2015	A record of reports issued and data sources: that for each of the reports issued, archive copies of the report be stored in PDF or similar protected document form in an archive repository with folders numbered in a logical order based on the Register of Reports' indexing arrangement.	Information and insights	Completed
98	Marshall 2013-2015	A record of reports issued and data sources: that data holdings required for replication of key registered reports be indexed and archived in retrievable data storage arrangements as at the date used.	Information and insights	Completed

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
99	Marshall 2013-2015	Identification of report authorship and underpinning data status: that reports for Minister, Assembly or Public release have a registration point that documents source data and clearance point and data and version of databases used in their production.	Information and insights	Completed
100	Marshall 2013-2015	Identification of report authorship and underpinning data status: that information analysis reports should have footnote reports metadata that allows identification of source data and reference data and definitions used that match what would be recorded in the register for more formal analysis reports.	Information and insights	Completed
101	PWC 2016	Document standards for ETL and other code which produce the metric values reported on the public website or Portal. (This should also include a mapping of data sources through PIP or BIU staging tables back to source datasets, as well clear business logic and a linkage to national rules/standards where applicable).	Data management	Underway
102	PWC 2016	Identify and leverage existing eHealth data initiatives. Confirm ownership of patient index master data (PIM) and any other in-flight master data or metadata project. Assess their data quality and if or how the data warehouse should be integrating them.	Data management	Underway
103	ACT Auditor-General 2015	Distribution of Validation Reports: The Health Directorate should finalise its new business rules for data validation and incorporate these in its data warehouse, then re-commence the distribution of validation reports for the Non-admitted Patient areas at Canberra Hospital and Calvary Public Hospital and for the Calvary Public Hospital Emergency Department.	Data management	Underway
104	ACT Auditor-General 2015	Tracking of Validation Activities: The Health Directorate should review the capability of its data warehouse and develop robust processes to track the validation activities performed by the hospitals. It should also define and promulgate the business rules required in correcting Activity Based Funding related data to ensure consistency across hospitals.	Data management	Underway
105	ACT Auditor-General 2015	Key Performance Indicators: The Health Directorate should develop KPIs for the validation of data that can be supported by information from the data warehouse.	Data management	Underway
106	Marshall 2013-2015	External audits of coding to activity datasets and conformance with costing standards be programmed sequentially for completion within the next twelve months and then followed up with an annual program over a three year cycle. The key purpose and focus of these audits should be to support a culture of data quality and standards conformance.	Data quality	Underway
107	Marshall 2013-2015	Data falsification risk management: that coding standards are to be applied and that professional ethics are reinforced relating to correct and even-handed application of coding standards and reports metadata definitions.	Data quality	Completed
108	Marshall 2013-2015	Data falsification risk management: that staff involved in the creation, edit and deletion of data are to manage data in an ethically appropriate manner.	Data quality	Ongoing
109	Marshall 2013-2015	Data falsification risk management: that feedback to data extraction and coding staff relate to variances from data standards.	Data quality	Ongoing
110	PWC 2016	Undertake a review and update where necessary, existing Report metrics against National Standards to improve comparability and align with better practice: a) Identify changes to the existing Report structure to present findings accurately and more meaningfully; and b) Amend, validate and sign-off Standards which may be updated to address any changes in the intent of the metric.	Information and insights	Underway

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
111	PWC 2016	Review and make determination on the inclusion of 'publications' to be subjected to the formal 'Ministerial Process' for publishing on the Government website.	Information and insights	Completed
112	PWC 2016	Identify Data Warehouse 'lockdown process' or 'snapshot date' for ongoing Quarter reporting purposes.	Data management	No longer relevant
113	PWC 2016	Apply name and date stamps to reports provisioned via email subscription that contain sensitive information, to reinforce that it is for the use of the recipient only, and not to be shared.	Information and insights	Underway
114	PWC 2016	Agree to a longer term strategy for delivering ED and ESWL reporting requirements. The 2016 PwC report recommends to define and prioritise ED and ESWL reporting requirements, build a new data warehouse for regular reporting and leverages data virtualisation for ad hoc reporting.	Information and insights	No longer relevant
115	PWC 2016	Agree short term remediations for ED and ESWL known issues.	Information and insights	No longer relevant
116	PWC 2016	Operational reporting (with the exception of live PIP and PIP NEAT reporting) should utilise management reporting from the source system (EDIS) and not from various data warehouse databases.	Information and insights	No longer relevant
117	PWC 2016	Operational reporting requirements are outstanding and will require consideration once available.	Information and insights	Completed
118	ACT Assembly Standing Committee 2015	The Committee recommends that the Government of the day should inform the ACT Legislative Assembly, at the earliest possible opportunity, if the emergency access targets under the National Partnership Agreement on Improving Public Hospital Services, will not be reached by the Canberra Hospital for the 2012 calendar year.	Information and insights	Completed
119	ACT Assembly Standing Committee 2015	The Committee recommends that the Health Directorate in conjunction with Shared Services ICT ensure that appropriate training on every IT related hospital system , with a particular focus on the Emergency Department Information System (EDIS), is provided to all staff at the Canberra Hospital and Calvary Public Hospital.	Workforce	Completed

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
120	Marshall 2013-2015	<p>Help desks: that, in accordance with the Reid/McKay report, within P&I Branch, a help desk function be maintained by data analysis staff (both local and out posted) and a log of queries recorded including:</p> <ul style="list-style-type: none"> a) queries should be differentiated according to topic and referred to subject matter experts (SME)s – e.g. epidemiological, Activity Based Funding, health service performance, coding and reports metadata, data quality issues. b) SMEs should make sure that advice is logged so that common themes, standard practice issues and training material can lever convergence to common understanding and skill in data meaning (reports metadata) and quality. c) a running log/newsletter of queries and answers should be maintained on the website – particularly FAQs. d) access to help desk be provided to all staff to enable self-service and knowledge based capacity <p>While not primarily the responsibility of a help desk, questions on the following areas can also be logged and the enquirers directed to appropriate subject matter experts or responsible functional areas by the helpdesk:</p> <ul style="list-style-type: none"> a) data quality and integrity b) data analysis and interpretation c) data release – system interfacing – data transfers and extraction d) reporting outputs authorisation. 	Communication	Underway
121	Marshall 2013-2015	Training and support in use and interpretation of data: that a user-friendly on-line library of training materials for data system users be developed or linked to the systems access register.	Workforce	Completed
122	Marshall 2013-2015	Training and support in use and interpretation of data: that principles of proper use of information should be defined as an organisation value and guideline. Questions that need to be addressed include: is this a values/moral/or purpose based concept? Is it the idea of how to best use systems for efficiently delivering correct observations? Is it the idea of ensuring that information selected for reporting is balanced relevant and reliable and not misleading? Is it a pragmatic construct based on creative selection of facts to achieve an agreed result?	Data governance	Underway
123	Marshall 2013-2015	Training and support in use and interpretation of data: that an index of training material be prepared, ideally web-based and linked to training material for online learning and reference.	Workforce	Completed
124	Marshall 2013-2015	Training and support in use and interpretation of data: that a training protocol be developed for each information system component and a register of expert users.	Workforce	Completed
125	Marshall 2013-2015	Data falsification risk management: that reinforcement from management be directed to timely and accurate reporting of hospital performance rather than favourable performance trends and a culture of emphasis on timely and accurate reporting of performance be reinforced.	Data quality	Ongoing
126	Marshall 2013-2015	Data falsification risk management: that data and analytical staff be encouraged to quickly and collaboratively report early indications of variations from normal trends to business areas both for the purpose of checking data integrity and also for early management information feedback, and responds variance from data standards.	Information and insights	Completed
127	Reid 2012	Greater utilisation should progressively be made of medical records data extraction for incident monitoring rather than dependence on the RiskMan system information.	Information and insights	Underway

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
128	Reid 2012	The ED P&I Branch should work with each Division to improve data analytics .	Information and insights	Completed
129	Reid 2012	P&I Branch should review its external liaison arrangements with Divisions to improve engagement with EDs/Clinical Directors on enhancing data quality. As one practical suggestion, the Branch should be present at monthly Divisional meetings to discuss scorecard data. Similarly, the ED of the Branch should be present at that part of the Executive Council meeting which discusses the Directorate scorecard.	Data quality	Completed
130	Reid 2012	The Chief Health Officer should develop a proposal for enhancing data linkages and improved performance measures for Executive consideration, across the Directorate scorecards.	Information and insights	No longer relevant
131	Reid 2012	The ongoing improvements to Divisional scorecards , together with the introduction of the data repository and better data linkages provide opportunities to move from process measures to output and outcome measures and these should be exploited.	Information and insights	Completed
132	Reid 2012	Each Division should be provided with a monthly whole-of-hospital scorecard to better contextualise their Divisional performance.	Information and insights	Completed
133	Reid 2012	A workshop should be held across the Directorate and with relevant external stakeholders to review current priorities for data linkage initiatives within the ACT.	Information and insights	Completed
134	Marshall 2013-2015	Metadata management and reference system be established and maintained as the authoritative reference point for reporting data standards citation.	Metadata management	Underway
135	Marshall 2013-2015	Data audit status and metadata standards: that metadata and messaging interfaces between operational data systems (both business and clinical) and statistical/management information reporting data repositories be documented and audit trail requirements established.	Data management	Underway
136	Marshall 2013-2015	Data audit status and metadata standards: that metadata be identified at each system interface so that the attributes and concepts described in the variable definitions and value labels align and complex mappings are minimised.	Data management	Underway
137	Marshall 2013-2015	Internal data audit and data quality assurance: that the specification of data quality standards and requirements for central data collections be clearly assigned to the Data Standards Unit and associated with the reports metadata specification functions.	Metadata management	Underway
138	ACT Auditor-General 2015	Guideline for the Non-Admitted patient Data Collection Process: The Health Directorate should finalise and implement the Non-Admitted Patient Activity Data Standards - Data standards for the recording and counting of non-admitted patient activity.	Metadata management	Underway
139	PWC 2016	Infographics a) Define the set of metrics to be reported in the infographics of the 2015-16 Annual Report. b) Only 7 of the 37 metrics are included in the main body of the Report. Suggest changing the infographics to use metrics from the body of the Report that are validated. c) Validate to source the 32 Non-Morbid data extractions.	Data quality	No longer relevant

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
140	PWC 2016	<p>Strategic Indicators – ACT Health:</p> <p>a) Validate to source the 6 non-Morbid data extractions.</p> <p>Metrics to be Validated:</p> <p>a) Percentage of assessed emergency [dental] clients seen within 24 hours</p> <p>b) Immunisation rates for vaccines in the national schedule for the ACT indigenous population</p> <p>c) The Mean Number of Teeth with Dental Decay, Missing or Filled Teeth at Ages 6 and 12 (DMFT Index)</p> <p>d) Reduction in the Rate of Broken Hips (Fractured Neck of Femur) for those aged over 75 years (rate per 1000 people)</p> <p>e) Mean percentage of overnight hospital beds in use (total)</p> <p>f) Mean percentage of overnight hospital beds in use (by hospital).</p>	Data quality	Underway
141	PWC 2016	<p>Statement of Performance:</p> <p>a) Validate to source the 14 non-Morbid data extractions.</p> <p>Metrics to be Validated:</p> <p>a) Mean waiting time for clients on the dental services waiting list</p> <p>b) % of the Women's Health Service Intake Officer's clients who receive an intake assessment service within 14 working days</p> <p>c) Proportion of detainees at the Alexander Maconochie Centre with a completed health assessment within 24 hours of detention</p> <p>d) Proportion of detainees at the Bimberi Youth Detention Centre with a completed health assessment within 24 hours of detention</p> <p>e) Justice Health services community contacts</p> <p>f) % of current clients on opioid treatment with management plans</p> <p>g) Alcohol & Drug Service community contacts</p> <p>h) Samples analysed</p> <p>i) Compliance of licensable, registrable and non licensable activities at the time of inspection</p> <p>j) Response time to environmental health hazards, communicable disease hazards relating to measles and meningococcal infections and food poisoning outbreaks is less than 24 hours</p> <p>k) Number of nursing (domiciliary and clinic based) occasions of service</p> <p>l) Number of allied health regional services (occasions of service)</p> <p>m) Proportion of clients attending 'Well Women's Check' within the Women's Health Service that are from culturally and linguistically diverse communities</p> <p>n) Proportion of children aged 0–14 who are entering substitute and kinship care within the ACT who attend to the Child at Risk Health Unit for a health and wellbeing screen.</p>	Data quality	Underway

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
142	PWC 2016	<p>Strategic Indicators – Local Hospital Network:</p> <p>a) Validate to source the 2 non-Morbid data extractions.</p> <p>Metrics to be Validated:</p> <p>a) The 2015-16 Estimated Hand Hygiene Rate</p> <p>b) Historical Hand Hygiene Rate</p>	Data quality	No longer relevant
143	PWC 2016	Review the business logic of reported metrics aligns to the intent of the strategic indicator or reporting requirement.	Data quality	Underway
144	PWC 2016	<p>Our Workforce:</p> <p>a) Validate to source the 11 non-Morbid data extractions</p> <p>Metrics to be Validated:</p> <p>a) All 11 tables in the Our Workforce section of the 2016 PWC report.</p>	Data quality	Underway
145	Marshall 2013-2015	External data audit: that a program of external audits be designed and commenced as soon as possible of the coding and MDS specification conformance of the key MDSs.	Data quality	Underway
146	Marshall 2013-2015	External data audit: that an external audit be commissioned to follow the coding audit of the costing data and conformance of the costing data to the NHCDC reporting standards. This audit should also be asked to report on fitness of costing data and system functionality for use of the costing reports for hospital operational management and feedback to clinical units on utilisation benchmarking.	Information and insights	Completed
147	Marshall 2013-2015	<p>External data audit: that a three year rolling audit program be developed and include:</p> <p>a) Review of internal data quality assurance checks on compliance, completeness and accuracy of data entry for all data flows. These QA processes should be designed to provide:</p> <ul style="list-style-type: none"> - systematic checking of highest risk variables at least once a year or more frequently according to risk rating – and - random sample checks of lower risk variables. - peer recoding checks and - statistical pattern analysis to identify atypical value distribution patterns by variable - reconciliation of counts against clinical unit throughput management statistics. <p>b) Where atypical patterns are observed in internal recoding studies or statistical analysis, follow up should occur by:-</p> <ul style="list-style-type: none"> - clinical review of observations against norms and advice on the face validity of the observed patterns - targeted recoding checks - data entry process inspection - notification to external audit for review where discrepancy remains unexplained or uncorrected. - external coding audit by recode of a random sample of coded records - statistical analysis of data patterns and - other matters that the auditors determine in discussion with the Health Directorate and ACT Government Audit. 	Data quality	Underway
148	PWC 2016	Provide QA oversight of the Quarterly Performance Report Q4 process.	Data quality	Completed

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
149	PWC 2016	Apply validation controls to subscription reports that enables checking of content prior to distribution for completeness and accuracy.	Data quality	Completed
150	ACT Assembly Standing Committee 2015	The Committee recommends that the [ACT] Minister for Health make representations at the appropriate forums to progress the concept of a regular national audit by the Commonwealth Auditor-General of health performance and data integrity as it relates to Commonwealth agreements through the recently amended legislative provisions of the Commonwealth Auditor-General Act 1997.	Data governance	No longer relevant
151	ACT Assembly Standing Committee 2015	The Committee recommends that the Government of the day detail to the ACT Legislative Assembly, at the earliest possible opportunity, how it will address and improve issues about achievements against throughput and triage targets as they relate to the Emergency Department at the Canberra Hospital.	Data governance	Completed
152	ACT Auditor-General 2015	Outcome Measures: Outcome measures for data quality (including data integrity metrics) should be developed and incorporated into the Health Directorate's Information Strategy 2015-2016. These should be monitored to assure the adequacy of data integrity, particularly for ABF-related data.	Data quality	Underway
153	ACT Auditor-General 2015	Evaluation, Corrective Actions and Assurance: The ACT Health Directorate's Information Management Strategy 2015-2016 should clearly articulate the following: a) key data integrity risks associated with ABF-related data and ACT Health Directorate's Independent Hospital Pricing Authority (IHPA) data submissions; and b) frequency and scope of controls assessments and other assurance activities that will be undertaken to provide assurance in relation to ABF data integrity. The Activity Based Funding data integrity risks and controls assessments above will need to be updated from year to year as IHPA's data submission requirements change.	Data governance	Underway
154	ACT Auditor-General 2015	Risk Based Approach to Investigations: The Health Directorate should undertake further investigation into the inconsistencies and anomalies identified by the data analytics, taking a risk-based approach to the investigation and focusing on the areas that have the potential to materially affect ABF data and funding.	Data quality	Completed
155	ACT Auditor-General 2012	The Health Directorate should review its performance indicators for publicly reporting the performance of Canberra's hospitals' emergency departments to include and give a greater emphasis to qualitative indicators relating to clinical care and patient outcomes.	Information and insights	Underway
156	ACT Auditor-General 2015	Analytical Review of Reporting: The Health Directorate should perform an analytical review to quality assure the six-monthly ABF data submission before it is sent to IHPA.	Data quality	Completed

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
157	ACT Auditor-General 2015	<p>Length of Stay, Overlapping Admissions and Type of Visit:</p> <p>a) Canberra Hospital and Calvary Public Hospital should review patient records on a random and weekly basis with a focus on the fields that are included in Activity Based Funding reporting.</p> <p>b) Canberra Hospital and Calvary Public Hospital should conduct refresher training for Emergency Department clerical staff on how to appropriately classify the 'type of visit' for patients presenting to the Emergency Department.</p>	Data quality	Completed
158	ACT Auditor-General 2015	<p>Non-Admitted Data and Systems: The Health Directorate and Calvary Public Hospital should investigate the root causes of errors in Non-admitted patient data, including errors in the indigenous status, postcode and funding source fields in the source data and the IHPA submission and develop and implement policies and procedures for improvement.</p>	Data quality	Underway
159	Marshall 2013-2015	Issue and implement the Data Quality Framework as a dataset editing and quality assurance framework and report quality-rating tool.	Data quality	Underway
160	Marshall 2013-2015	Training in values and best practice in data security: that ongoing, unresolved discrepant levels of validation edits be referred for specific audit review in the next data audit.	Data quality	Underway
161	Marshall 2013-2015	Implementation of data quality framework: that each dataset be documented in a register with a history of the data validation and data quality checks that have been applied in addition to the data quality report.	Data quality	Underway
162	Marshall 2013-2015	Implementation of data quality framework: that the register entry for each dataset include source datasets from which it is extracted and reports metadata used for definitions of variables and value definitions in each variable.	Data quality	Underway
163	Marshall 2013-2015	Implementation of data quality framework: that each iteration of each dataset be recorded as cross-referenced a new entry in the register (and/or a clearly marked comment for each minor update).	Data quality	Underway
164	Marshall 2013-2015	Internal data audit and data quality assurance: that a clear role that needs to be operating with the Internal Audit Branch that interfaces with and integrates data quality assurance functions and operates as a dedicated Internal Data Audit program. This could be achieved by the role and scope of the current Data Quality Assurance unit be changed manage the internal information audit role and that it be renamed to reflect this function and interfaced in the planning and delivery of this.	Data quality	Underway
165	Marshall 2013-2015	Internal data audit and data quality assurance: that the role of the Central Data Repository currently in implementation absorb all core data set data edits and programmed data quality assurance functions for the central data repository and that they be automated within the ETL functions where possible.	Data management	Underway
166	ACT Assembly Standing Committee 2015	The Committee recommends that all ACT Government directorates and agencies should have effective practices and processes in place to review all reports of the Auditor-General , and to assess the relevance of the findings and recommendations to their agency, regardless of whether the agency was involved in a specific audit.	Data quality	Completed
167	Reid 2012	All data sets, which are provided externally, should be 'accredited' by the ED P&I Branch. This accreditation process should be designed to approve the data sources, standards and definitions.	Data management	Underway

Rec. #	External Report	Recommendation	Domain	Progress as at 31 March 2018
168	Reid 2012	In undertaking this 'accreditation', the ED P&I Branch should assess the appropriateness of the continuation of the external provision of data by Divisions or whether alternative arrangements are proposed. It is expected there will be some circumstances where information, currently distributed within the Directorate and/or to the national agencies without the involvement of the P&I Branch, will need in future to be formally cleared through P&I Branch.	Data management	Completed
169	Reid 2012	Once the data sets are on the register, accredited and the arrangements are deemed appropriate, the data should continue to be provided by the relevant Division.	Data management	Completed
170	ACT Assembly Standing Committee 2015	The Committee recommends that the 8th ACT Legislative Assembly Standing Committee on Public Accounts should give due consideration to conducting an inquiry into the process of future delivery of health care services across the Canberra Hospital and Calvary Public Hospital.	Data governance	Completed
171	Reid 2012	More regular audits of clinical coding should be undertaken by the Health Directorate to highlight areas for quality improvement. This highlighted focus on accuracy of clinical coding is particularly critical leading up to the advent of Activity Based Funding.	Data quality	Ongoing
172	Reid 2012	Innovative tools to enable a more cost effective data capture be identified and evaluated by the ICT Management Committee.	Data management	Completed
173	Reid 2012	The workload of clinical coders' assessed and appropriate adjustments made to ensure the targets proposed for coding timelines are achieved.	Data quality	Completed
174	ACT Auditor-General 2012	The Health Directorate should, in conjunction with Shared Services ICT, finalise the draft Business System Support Agreement between Shared Services ICT and the Health Directorate for EDIS.	Data management	No longer relevant
175	ACT Assembly Standing Committee 2015	The Committee recommends that the Minister for Health give consideration to finalising the Government submission to the Standing Committee on Public Accounts in response to Auditor-General's Report No. 6 of 2012: Emergency Department Performance Information earlier than three months after the report being tabled.	Data governance	No longer relevant

3. ESSENTIAL AND PRIORITY EXTERNAL REPORTS

To address Terms of Reference 2.1 and 3.1 the essential and priority external reports have been identified in collaboration with national agencies and outlined below.

Table 34 ACT Health essential and priority reports as at 31 March 2018

Purpose	Group description	Report description		
Funding	National Health Reform Agreement	Activity Based Funding Admitted Patient Care		
		Activity Based Funding Emergency Department Care		
		Activity Based Funding Mental Health Care Ambulatory		
		Activity Based Funding Mental Health Care Episode		
		Activity Based Funding Mental Health Care Phase		
		Activity Based Funding Non Admitted Patient Aggregate		
		Activity Based Funding Non Admitted Patient Level		
		Activity Based Funding Palliative Care		
		Activity Based Funding Subacute		
		Activity Based Funding Teaching Training & Research		
		National Hospital Cost Data Collection		
		National Health Reform Agreement Admitted Patient Care Submission B		
		National Health Reform Agreement Emergency Department Submission B		
		National Health Reform Agreement Non Admitted Patients Submission B		
		National Weighted Activity Unit Aggregates		
		Other Commonwealth Funded Programs		Aged Care Assessment Programme
				Breast Screen data to Australian Institute of Health and Welfare for national reporting
				Commonwealth Home Support Program data
				National Partnership Agreement for Essential Vaccines
				National Disability Insurance Scheme activity data
Radiation, Diagnostics and Therapy Workforce Programme Progress Report				
Record level data collections provided to Department of Veteran's Affairs – Admitted Patient Care				
Record level data collections provided to Department of Veteran's Affairs - Emergency Department				
Record level data collections provided to Department of Veteran's Affairs - Non-Admitted				
Record level data collections provided to Department of Veteran's Affairs - Palliative Care				
Non governmental organisation Programs		Transitional Care Program		
		Non governmental organisation data - McGrath Foundation		
		Non governmental organisation data - Prostate Foundation		
		Non governmental organisation data - Youth Cancer Services - Canteen		

Purpose	Group description	Report description	
	Cross-Border Agreements	Cross Border Agreements data	
Legislative	ACT Health Reports	ACT Chief Health Officer's Report/HealthStats ACT	
		Annual Report	
		Half-Yearly Accountability Indicator Progress Report	
	National Health Information Agreement for the Australian Institute of Health and Welfare Reporting	Admitted Patient Care National Minimum Data Set	
		Alcohol and Other Drug Treatment Services National Minimum Data Set	
		Community Mental Health Care National Minimum Data Set	
		Elective Surgery Waiting Times (Census) National Minimum Data Set	
		Elective Surgery Waiting Times (Removals) National Minimum Data Set	
		Emergency Department Care National Minimum Data Set	
		Government Health Expenditure National Minimum Data Set	
		Mental Health Establishments National Minimum Data Set	
		Non Admitted Patient Care (Aggregate) National Minimum Data Set	
		Palliative Care National Minimum Data Set	
		Perinatal National Minimum Data Set (Aggregated)	
		Public Dental Waiting Times National Minimum Data Set	
		Public Hospital Establishments National Minimum Data Set	
		Radiotherapy Waiting Times National Minimum Data Set	
	Residential Mental Health Care National Minimum Data Set		
	Report on Government Services - Accountability Indicators		
	Subacute Care National Minimum Data Set		
	Accreditation and Safety & Quality	Accreditation reporting	
		Australian Commission on Safety and Quality in Health Care data - Core, hospital-based outcome indicators	
	Disease Surveillance	Cancer Registry Extract	
		Communicable diseases notifications within the ACT	
	Australian Bureau of Statistics Collections	Private Health Establishments Collection	
	Operational and Other	Peer Benchmarking	Surgeon Waiting Times
		Other reports and data collections	Australian Institute of Health and Welfare - Admitted subacute and non-acute hospital care National Best Endeavours Data Set
Australian Institute of Health and Welfare - Australian Cancer Database			
Australian Institute of Health and Welfare - Local Hospital Networks Data Set Specification			
Australian Institute of Health and Welfare - Mental Health seclusion and restraint National Best Endeavours Data Set			
Australian Institute of Health and Welfare - Non Admitted Patient Care (Episode Level)			
Australian Institute of Health and Welfare - Perinatal National Best Endeavours Data Set			
Australian Institute of Health and Welfare - Prisoner Health National Best Endeavours Data Set			

Purpose	Group description	Report description
		<p data-bbox="595 197 1399 253">Australian Institute of Health and Welfare - SA1 of usual residence National Best Endeavours Data Set</p> <p data-bbox="595 275 1310 331">Australian Institute of Health and Welfare Mental Health Establishments Skeleton</p> <p data-bbox="595 353 1278 409">Australian Institute of Health and Welfare report - Mental Health Key Performance Indicators</p> <p data-bbox="595 432 1161 454">Mental Health National Outcomes and Casemix Collection</p>

4. ROOT CAUSE ANALYSIS

The findings and recommendations of the Root Cause Analysis were spread across four key themes: (1) Strategy, (2) Data and ICT Governance, (3) Communication and Collaboration, and (4) Change Management.

Strategy

Strategy - Strategy and data activities are not aligned across ACT Health

<p>Findings</p>	<p>There is a lack of data strategy integration across ACT Health</p> <ul style="list-style-type: none"> - Although data activities from different areas of ACT Health refer to organisational level objectives, there is limited evidence that local strategies are aligned with the Directorate’s evolving data strategy - Discussions of data issues focused on individual accountability without also discussing the collective responsibility of the organisation <hr/> <p>The existing Digital Health Strategy has not been aligned to data requirements</p> <ul style="list-style-type: none"> - The digital health strategy, data strategy, and work force strategy are all in development - Historically ICT health decisions reflected the ‘best of breed’ strategy to meet varying user needs, having an adverse impact on the ability to achieve system level needs of consistency and integration - There are over 250 systems in use across ACT Health to collect data, with different data definitions and varying levels of connectivity - Users reported a lack of an ongoing maintenance plan (especially for regular updates to applications to support mandatory reporting), in part due to budgetary constraints, resulting in key data systems being outdated <hr/> <p>Performance, Reporting and Data Division staff lack strategic clarity</p> <ul style="list-style-type: none"> - There were pockets of staff that reported not having a clear understanding of how data activities are prioritised and actioned - Current data activities have prioritised mandatory reporting requirements, which, while necessary, has resulted in not being ready for next generations technologies <hr/> <p>Workforce</p> <ul style="list-style-type: none"> - The data system training was not perceived as being sufficiently customised to address the differing needs of user groups, or to highlight the importance of accurate data - Insufficient training time is allocated for ICT systems and therefore quality data entry is not promoted or seen as a priority - It was reported that internal transfers to new roles within ACT Health were not systematically supported by training to meet role requirements - At times the instructions from virtual training and on-the-job training differed, resulting in uncertainty of the requirements and inconsistency in system use - The shift to delivering training in a virtual environment was perceived to introduce a gap as it was not clear who to contact for queries
<p>Recommendations</p>	<ol style="list-style-type: none"> 1. Align evolving Data, Digital Health and Workforce strategies <ul style="list-style-type: none"> ❖ A coordinated approach to align the workforce and technologies through change management and improved communications ❖ Align strategies with the roadmap for change <hr/> 2. Invest in a single point of access to linked real time data <ul style="list-style-type: none"> ❖ Simplify access to data and share growing data collection with users across ACT Health to support quality insights ❖ Provide an easy to use, single point of truth across all current and future systems ❖ Promote real time data entry and analysis while maintaining security and privacy standards

- 3. Improve ICT system architecture to better support clinical workflows and information provision**

 - ❖ For the priority data areas, use information from the workflow mapping to identify specific points where data entry does not match workflow
 - ❖ Address the priority areas where system design and workflow are not aligned

- 4. Substantially reduce the number of systems collecting data**

 - ❖ Identify opportunities for consolidation where multiple systems are performing the same or similar functions
 - ❖ Consider the systems in use in other countries or jurisdictions

- 5. Implementation of the Performance, Reporting and Data Management Strategy when prioritising work and resources**

 - ❖ Consult with staff for the development of the Data Governance and Assurance Framework
 - ❖ Require that decisions be made in reference to organisational data use priorities

- 6. Work with users of data to take advantage of the broad range of data available**

Work with users of data across ACT Health and external stakeholders to take advantage of the broad range of data collected. This may include developing systems to:

 - ❖ Make use of automation and data analytics to provide real time insights and reduce duplication of data entry and manual handling
 - ❖ Measure and compare patient outcomes and the resources used to achieve them
 - ❖ Capturing the life course of the individual to identify service provision and policy requirements to improve the health of the individual and the community
 - ❖ Prepare data to leverage future technologies such as artificial intelligence
 - ❖ Increase sharing of information with providers in other jurisdictions

- 7. Incorporate workforce strategy and roles into training design**

 - ❖ Review the current training program to determine if any user training needs are unmet
 - ❖ Instigate a process for ongoing feedback and regular contact opportunities with data specialists
 - ❖ Determine what follow-up or ongoing training programs are needed to keep staff knowledge current and provide opportunities for further development
 - ❖ Educate staff on the importance of organisational consistency and have a mechanism to promote ongoing behaviour
 - ❖ Promote uptake of available training by understanding and addressing potential barriers such as required time commitment, perceived benefit of training, and delivery methods

Impact

- Alignment across people, technology and systems
- Increase timely access to data to support decision making
- Increase familiarity with the available data
- Increase simplicity of system design and increase ease of real-time data entry
- Decrease the number of programs that require training, support, integration and maintenance
- Increase commitment to achieving strategic goals
- Advance the way data is used to inform service provision to the Canberra region
- Build support for quality data through demonstrating what can be achieved
- Build support and capability for staff to complete the data elements of their job to the best of their ability

Data and ICT governance

Data and ICT governance – The Data Governance Framework is not consistently or fully implemented

<p>Findings</p>	<p>Organisational</p> <ul style="list-style-type: none"> – There is not a single centralised hub of data stewardship – Governance structures to manage ACT Health data are not clearly defined or communicated, including parties responsible for making decisions that impact data capture – The extent to which people are adhering to existing data security and privacy policies has not been measured <hr/> <p>Policies and standards</p> <ul style="list-style-type: none"> – Data definitions are not consistent across the organisation or consistent with national standards – The data limitations were not documented or known by all users resulting in errors or inconsistency in interpretation, as well as difficulties identifying the most appropriate inputs and methods of analysis <hr/> <p>Processes</p> <ul style="list-style-type: none"> – The process for data capture does not follow the flow of patient care or staff workflow, resulting in workarounds such as data capture recorded on paper and not always in official systems – The complete functionality of key data systems is not well documented and therefore not well understood – Processes with a high reliance on paper forms, manual entry and duplication of entry continue for some systems <hr/> <p>Compliance and measurement</p> <ul style="list-style-type: none"> – The inputs and processes used to generate reports are complex and only understood by a limited number of users – Due to the number of systems in use there have been instances of inconsistencies between reported figures and locally held information – Confidence in data has been diminished as it does not consistently provide a real-time snapshot – There is a perception that the checks and balances for data accuracy are not validated at the source of data entry and do not support accurate or contextual reporting – There appears to be variable effectiveness in communication between data entry and reporting staff
<p>Recommendations</p>	<p>8. Complete implementation of the Data Management and Governance Framework for ICT and data including application of data definitions consistent with national standards</p> <ul style="list-style-type: none"> ❖ Agree and communicate ownership of data governance for ACT Health ❖ Develop and implement enterprise level data policies and procedures ❖ Identify the critical performance metrics that add value to ACT Health ❖ Use controls and standards to assess and monitor data quality to increase trust in the data ❖ Support staff to contribute to the quality use of data within the scope of their responsibilities ❖ Use the data strategy to agree the data areas for quality to be prioritised ❖ Acknowledge that data are predominantly collected in pre-configured systems and therefore there are limitations of data collection that are unavoidable, such as only being able to record one address per patient <hr/> <p>9. Conduct an assessment of data quality</p> <ul style="list-style-type: none"> ❖ Apply data quality dimensions to measure and assess the data quality against defined standards (for example, the Data Management Association’s quality dimension) ❖ Check data for completeness, consistency, uniqueness, validity and data accuracy ❖ Understand the strengths and current capacity of data governance systems and identify priority areas for improvement

Data and ICT governance – The Data Governance Framework is not consistently or fully implemented	
	<p>10. Perform an assessment of the ACT Government Protective Security Policy Framework to ensure compliance</p> <ul style="list-style-type: none"> ❖ Assess compliance with security and privacy legislation and frameworks ❖ Perform a readiness assessment of ACT Health’s ability to conform with anticipated future data security and privacy requirements
Impact	<ul style="list-style-type: none"> • Confidence in relying on data for decision making through improvements in accuracy, consistency and interpretation • Improve trust in the data systems • Provide a baseline measurement for future comparison • Alignment with the Data Management Association (DAMA) framework • Increased confidence in data security for the entire data life-cycle • Certainty that all possible actions are taken to assure patient privacy

Communication and collaboration

Communication and collaboration – There is a need to improve communication channels across the ACT Health	
Findings	<p>Communication</p> <ul style="list-style-type: none"> – The level of communication across the directorate requires improvement to support collaboration and ensure understanding of data activities – The roles and responsibilities of people involved in data activities were not well understood across the organisation – Many data entry officers were unclear about the importance of quality data entry as they were unaware of the full use of the data and how it contributes to achieving organisational goals <hr/> <p>Collaboration</p> <ul style="list-style-type: none"> – There was a general perception that decisions regarding implementing and modifying data systems were made without comprehensive consultation or communication – There is a strong sense of service identity, linked to the location, not to ACT Health <hr/> <p>Sharing knowledge</p> <ul style="list-style-type: none"> – The transfer of corporate knowledge has a high dependency on certain individuals without a structure for knowledge transfer – Access to expertise in data when requesting extractions of data for reports is not readily available in many areas – Territory-wide professional networks and forums appear to have broken down – Feedback on the use of data systems is not regularly provided
Recommendations	<p>11. Implement a communication plan for internal and external stakeholders</p> <ul style="list-style-type: none"> ❖ Demonstrate to staff how data are used at ACT Health, and their responsibilities in ensuring its completeness and accuracy ❖ Identify data specialists across different systems, assign them as the key contact and distribute information detailing who to contact for what type of query and how ❖ Establish expectations about updates to data and the balance between reporting consistent figures, and figures that capture the most up-to-date data ❖ Establish formal channels of regular communication <hr/> <p>12. Communicate the confidence levels and limitations of data</p> <ul style="list-style-type: none"> ❖ Acknowledge that data can be biased and needs strong governance ❖ Provide people with the information they need to make informed decisions when interpreting and representing data
Impact	<ul style="list-style-type: none"> • Build awareness of the important role of data in organisational management and clinical service provision • Increase connectivity across the organisation to increase understanding and support

Communication and collaboration – There is a need to improve communication channels across the ACT Health

- Foster a professional collaborative professional network to support jurisdiction-wide initiatives
- Increase understanding of accurate data interpretation and representation

Change management

Change management – Existing change management processes have not yet achieved their full impact

<p>Findings</p>	<p>Change management</p> <p>Acknowledging change management is an ongoing process and recommendations continue to be implemented:</p> <ul style="list-style-type: none"> – Consultation with staff identified a lack of detailed understanding of some of the immediate actions undertaken as part of the System-Wide Data Review – Although staff were able to articulate the future solution and what it would achieve, less detail was available on the steps that would need to be taken to get there and the interim measures in place to address existing gaps – Although progress of actions against the external review recommendations is being tracked, the impact of the changes made have not yet been measured – A coordinated enterprise change management program does not exist
<p>Recommendations</p>	<p>13. Use a standard structure to support change management</p> <p>For example, using a methodology to:</p> <ul style="list-style-type: none"> ❖ Build awareness of the problem and the impact on ACT Health ❖ Build desire and agreement for change by communicating the individual and organisational benefits ❖ Invest in knowledge to successfully deliver the change such as training staff and establishing change agents ❖ Allocate resources and build process to implement the change ❖ Implement the change ❖ Measure the benefits achieved through change and share the information with staff ❖ Sustain the change <p>14. Measure and share the impacts of changes with staff across ACT Health</p> <ul style="list-style-type: none"> ❖ Demonstrate to staff across ACT Health that issues of data quality are being addressed using a systematic and measured structure ❖ Understanding change is a gradual and continuous process and that continued effort generates continued reward
<p>Impact</p>	<ul style="list-style-type: none"> • Change will be effectively implemented • Build trust with ACT Health staff that people’s concerns have been listened to and are being addressed • Grow confidence in the quality of data

5. CURRENT STATE OF CONSUMER DATA

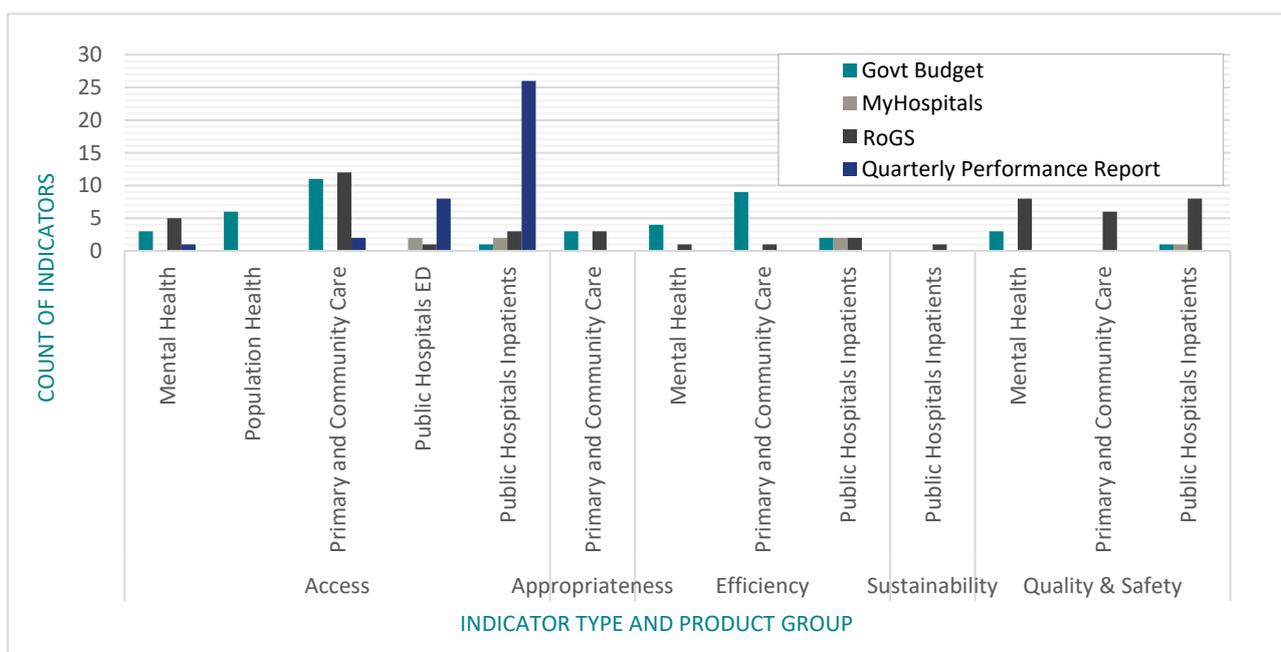
A desktop review was undertaken to determine the existing status of data and information that is available for consumers to access. The analysis found the following:

1. There are 138 ACT Health performance metrics that are published either locally or nationally, soft or hard copy or on-line and in real-time, as outlined in the Table below.

Table 35 Current performance metrics available by indicator type

Indicator type	Number
Access	83
Appropriateness	6
Efficiency	21
Quality and safety	27
Sustainability	1

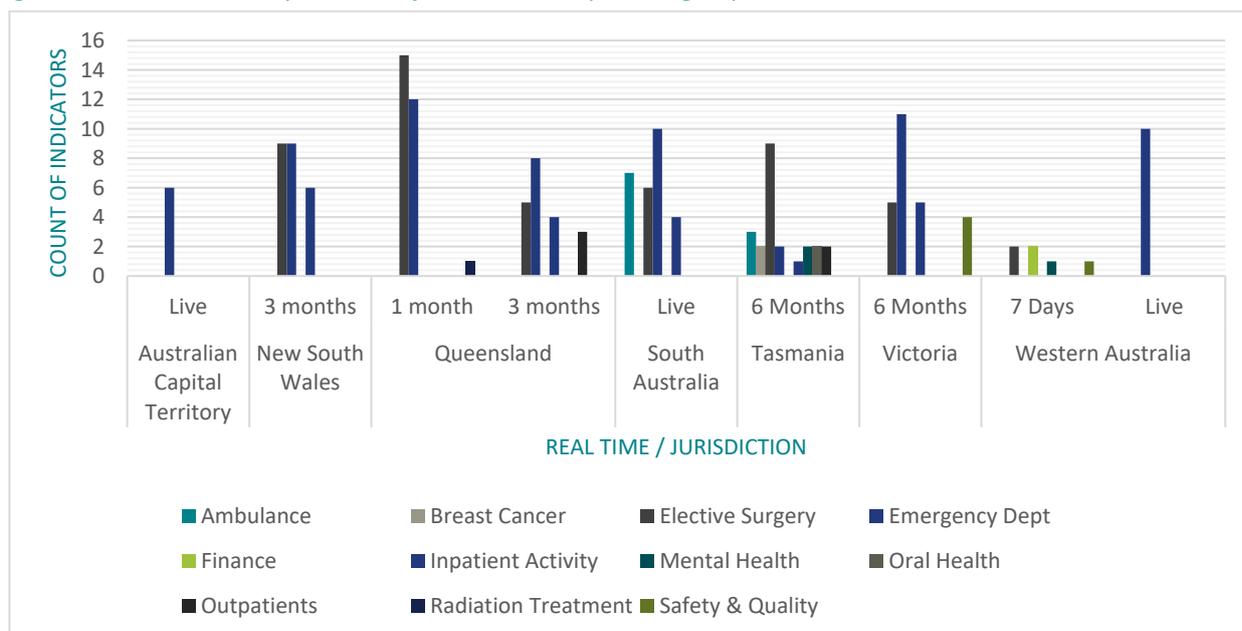
Figure 9 Published indicators by type, product group and source



2. A desktop review of data available for other jurisdictions (with the exception of the Northern Territory who do not publish data) identified that:

- Three jurisdictions have 'real-time' (live) data for emergency departments including ACT, Western Australia and South Australia
- South Australia also has real-time data for elective surgery, ambulance and inpatients
- A number of jurisdictions publish weekly, monthly, quarterly and/or six monthly datasets for example:
 - Tasmania publish seven different product groups six monthly including emergency departments, elective surgery, inpatients, breast cancer, ambulance services, oral health and outpatients
 - Western Australia publish weekly elective surgery, finance, mental health and quality and safety information
 - New South Wales publishes quarterly elective surgery, emergency department and inpatients information.

Figure 10 Published data by real-time, jurisdiction and product group



- There is an abundance of information available to the public for most jurisdictions but they are largely in the form of reports with minimal live data with the exception of live emergency department data.
- Consumers may have difficulty navigating their way through online publications to find the information.
- The Quality, Governance and Risk Division has developed the ACT Health Quality Strategy this work included partnering with the Health Care Consumers Association to ensure engagement with patients, families and carers in regards to the type of information required.
- The Australian Health Ministers Advisory Council has approved the new Australian Health Performance Framework which has been recommended by the National Health Information and Performance Principle Committee to consolidate existing national frameworks. The new Australian Health Performance Framework has recently been endorsed by the Council of Australian Governments.
- The Standing Committee on Health, Ageing and Community Services has released its Report on Annual and Financial Reports 2015-2016 recommending that the Health Directorate review the relationship between Strategic Objectives and Output Classes and ensure there are clear and useful performance indicators for each objective or output, and report back to the Committee on findings of the review within 6 months. In addition, the Committee noted that there are no indicators that relate to a client satisfaction measure.
- The ACT Auditor-General’s Report, Mental Health Services -Transition from Acute Care Report, No. 6/2017 has recommended that the Health Directorate review and rationalise its performance reports by a range of activities including reporting the performance of provisions of the *Mental Health Act 2015* and including person outcome and outcome compliance measures from Health of the Nation Outcome Scale and Life Skills Profile.





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