LEADING DATA REFORM: THE WAY FORWARD

OUTCOMES OF THE ACT HEALTH
SYSTEM-WIDE DATA REVIEW
AUGUST 2018

ACT
Government
Health

CONTENTS

EXECUTIVE
SUMMARY

THE SYSTEM-WIDE DATA REVIEW

The System-Wide Data Review positions ACT Health 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 data reform programs will reside, enabling intelligence, innovation and leading analytics that will leverage the full capability of the complex datasets ACT Health holds. It supports ACT Health's vision of best practice performance and quality as well as continuous improvement of patient outcomes and a commitment to quality health services.

The Minister for Health and Wellbeing initiated the System-Wide Data Review in mid-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. 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 this time, ACT Health has reviewed lessons learnt, built capability and capacity, and developed a best practice Performance, Reporting and Data Management Strategy (the Data Strategy). The Data Strategy will be implemented over the next three years, strongly supported by the ACT Health Digital Health Strategy, which will be a key enabler to address root cause and systemic issues. This approach will position ACT Health as a best practice health informatics organisation.

> **ACT Health Performance, Reporting and Data Management Strategy**
> *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. Specifically the Root Cause Analysis provided significant insight to the underlying causes of the issues 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. The structure of this Report is grouped by the nine domains in Figure 1.

There are many key achievements that have already been delivered by the System-Wide Data Review, such as meeting external reporting requirements, and commencing the build of a new data repository as the single source of truth for all data requirements. ACT Health will continue this significant program of work to realise and address the full findings of this Review.

Note: For detailed information about the Terms of Reference and how they were addressed, please refer to the System-Wide Data Review page on ACT Health's website at www.health.act.gov.au.

Figure 1. Informatics domains

D1 - Data management	D2 - Data governance	D3 - Data quality
D4 - Metadata management	D5 - Data security and privacy	D6 - Workforce
D7 - Communication	D8 - Change management	D9 - Information and insights

KEY FINDINGS

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

Domain	Key finding
D1 – Data management	• 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	• 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	• 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 life-cycle
D4 – Metadata management	• 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	• 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	• 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	• 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	• 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	• 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
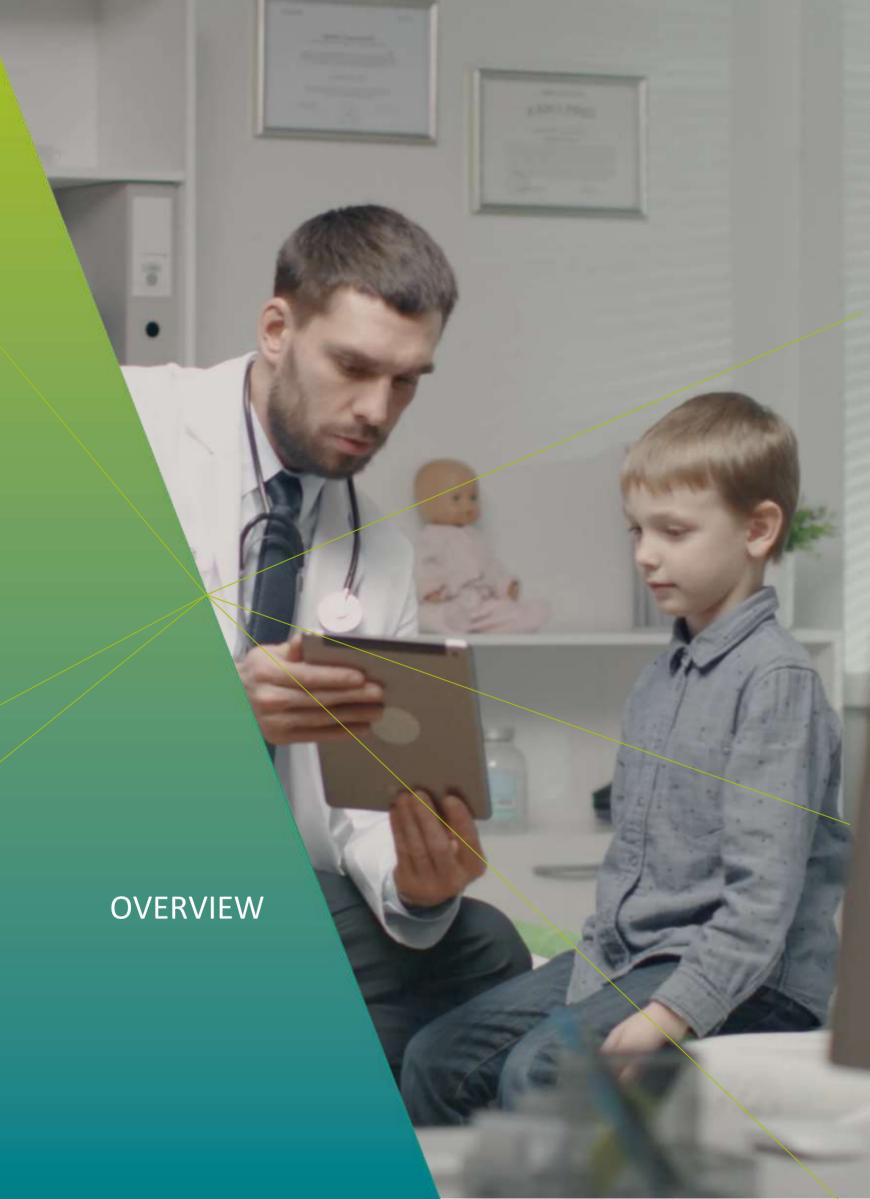
KEY RECOMMENDATIONS

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.

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 (approved by the Minister for Health and Wellbeing), which 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.

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 best practice 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.

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. A program of work activity which addresses the recommendations has also been included.

Theme	Key findings	Recommendations	Core System-Wide Data Review activities to address recommendations
Strategy	– 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 generation 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 4. Substantially reduce the number of systems collecting data	D1.5 Upgrade systems including partnering and alignment with the ACT Health Digital Strategy
		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 stategy 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	– Data and systems governance processes are not coordinated, hindering data oversight and therefore not having the intended impact. – Governance structures, polices, 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. – Adherence to security and privacy policies has not been assessed.	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
Communication and collaboration	− 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.	11. Implement a communication plan for internal and external stakeholders	D7.1 Communications strategy
		12. Communicate the confidence levels and limitations of data	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
Change management	− 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.	13. Use a standard structure to support change management	D8.1 Change management process D8.2 Change Control Board
		14. Measure and share the impacts of changes with staff across ACT Health	D7.1 Communication Strategy D7.3 Performance, Reporting and Data SharePoint site and Intranet Portal

Note: For detailed information about the findings and recommendations from the Root Cause Analysis, please refer to the System-Wide Data Review page on ACT Health's website at www.health.act.gov.au.

WHAT WILL THE FUTURE LOOK LIKE FOR CANBERRANS?

ACT Health's objective 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.

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

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.

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

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 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.

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.

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

THE FUTURE COMMITMENT

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

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 2) to which each of the program activities has 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).
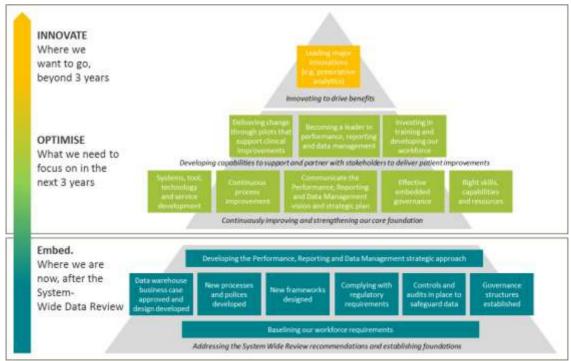
Figure 2 Domains

Moving forward

As shown in Figure 3, ACT Health will enhance and build on the foundations established during the System-Wide Data Review to become a leading health data 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 3 Where we are now after the System-Wide Data Review compared with where we want to go

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.

Over the last 10 years, ACT Health has had investment in technical infrastructure and systems to improve the capabilities in relation to data capture. This investment has been guided by the digital strategy of the time and has focussed on bolstering infrastructure to provide a robust experience across ACT Health when using technology solutions, improving support services and moving clinical data capture from paper to electronic processes.

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 managed[1]

- 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.

From 2012 to 2016, there were six independent reviews of data quality and reporting processes, resulting in 175 recommendations (see Figure 4).

Figure 4 Summary of external review reports

External review report name	Report by	Year	Number of recommendations
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**

Note: For detailed information about the recommendations from the external review reports, please refer to the System-Wide Data Review page on ACT Health's website at www.health.act.gov.au.

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 Reference[2] in the ACT Legislative Assembly, which specified the outcomes expected by 31 March 2018.

An initial piece of work for the System-Wide Data Review was to better understand the recommendations resulting from the external reviews. Using 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), nine informatics domains were identified. The 175 recommendations were then mapped to the domains to support the future development of a program of activities arising from the System-Wide Data Review (see Figure 5).

Figure 5 Number of recommendations from external reviews by domain

Domain	Number of recommendations by domain
Communication	2
Metadata management	4
Change management	5
Workforce	11
Data security and privacy	19
Information and insights	26
Data management	33
Data governance	36
Data quality	39

■ Number of recommendations by domain

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 decisions[3].

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 250), 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 data[4]. 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.

60% — 60 % improvement in the ability to admit patients

30% — 30% faster bed assignments in the emergency department

21% — 21% increase in patient discharges before noon

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 Health Care 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 volume of data required by national health agencies as a result of these reforms. For example, the Independent Hospital Pricing Authority uses 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 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 health 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 long-term reform recommendations are:

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.
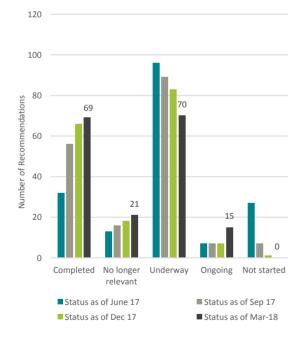
GOVERNANCE

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 6 and Figure 7 below provide a snapshot of the number and proportion of recommendations from the external reviews complete or underway at each of the key milestones. Figure 7 includes only those recommendations that have been assessed as still relevant to ACT Health (154 of the 175 recommendations).

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

Figure 6 Progress across 175 recommendations from the external reviews

Figure 7 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 nine domains, and once implemented would embed the fundamentals of best practice end-to-end data management.
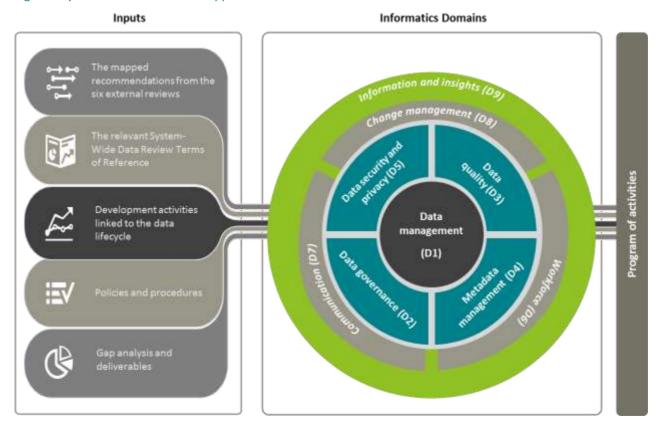
The overarching approach to develop the program of work for the System-Wide Data Review is outlined in Figure 8 and includes the following four key steps:

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 life-cycle, current policies and procedures, and a gap analysis of all other areas based on data management best practice research.

2. Based on significant research of best practice activities from leading jurisdictions, nine informatics domains were identified. The domains defined key elements for consideration when developing robust and quality assured data management practices

3. The development of a new ACT Health Performance, Reporting and Data Management Strategy based on the nine domains.

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 a program of activities 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 8 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 workings 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 program of activities has been identified and categorised to indicate:

- Immediate activities completed during the System-Wide Data Review

- Immediate activities commenced during the System-Wide Data Review

- Future activities to achieve ACT Health's Performance, Reporting and Data Management Strategy over the next three years, which have been mapped against one of the three implementation phases identified in that Strategy and set out below in Figure 9.

The program of activities is summarised on page 22 and described in detail for each domain on pages 23-36.

The following colours and symbols are used to identify the purpose and progress of each activity in the program of activities:

🟪	✔	Immediate activities completed during the System-Wide Data Review
🟦	•	Immediate activities commenced during the System-Wide Data Review
⬜	❖	Future activities

Figure 9 Implementation phases for the program of activities

1. Embed	2. Optimise	3. Innovate
Implementing the recommendations from the System-Wide Data Review to establish the foundations of a robust and quality assured health data and information system.	Enhance and build on the foundations to extract greater value from existing datasets to inform timely and evidence-based decision making.	Becoming a data backed, insight led health system that has analytics embedded into core processes to drive continuous improvement and change.

ACTIVITIES BY DOMAIN

Columns: EMBED | OPTIMISE | INNOVATE

Domains

D1. Data management
- D1.1 Data submission specifications
- D1.2 Data repository process: New data repository business case
- D1.3 New data repository business case
- D1.4 Data Management Strategy
- D1.5 Upgrade/reduce the number of data collection system

D2. Data governance
- D2.1 Data governance roles and responsibilities matrix
- D2.2 Governance committees identified
- D2.3 Establish Reporting Coordination Unit
- D2.4 Root Cause Analysis
- D2.5 Data Management and Governance Framework
- D2.6 Data policy and procedures
- D2.7 Data management plans for all service areas

D3. Data quality
- D3.1 Quality assurance and clearance steps
- D3.2 End of year business processes
- D3.3 Data Validation Strategy
- D3.4 Develop audit program across source systems
- D3.5 Audit program – baseline assessment
- D3.6 Clinical Coding Strategy
- D3.7 Gap analysis of data collection
- D3.8 Data Quality Framework and Strategy
- D3.9 Data quality statements for priority datasets
- D3.10 Data Management Group
- D3.11 Data resubmission

D4. Metadata management
- D4.1 Mapping of reports to source systems
- D4.2 Memorandum of Understanding with the Australian Institute of Health and Welfare for data and metric definitions
- D4.3 Australian Institute of Health and Welfare metadata registry
- D4.4 Metadata model

D5. Data security and privacy
- D5.1 Security and access policies
- D5.2 Develop training package for security and access
- D5.2 Perform an assessment of the ACT Government Protective Security Framework to ensure compliance

D6. Workforce
- D6.1 Baseline and recruitment of internal data management workforce
- D6.2 Performance, Reporting and Data Management Strategy
- D6.3 Staff performance plans
- D6.4 Performance, Reporting and Data training and orientation package
- D6.5 Benchmark internal workforce requirements
- D6.6 ACT Health data management training package
- D6.7 Gap analysis of data management workforce

D7. Communication
- D7.1 Communications Strategy
- D7.2 Develop processes to generate a queries log within the Reporting Coordination Unit
- D7.3 Performance, Reporting and Data SharePoint site and intranet portal

D8. Change management
- D8.1 Change management process
- D8.2 Change Control Board

D9. Information and insights
- D9.1 Register of mandatory reports and schedules
- D9.2 ACT Health strategic and national indicators mapping
- D9.3 Identify current state of consumer data
- D9.4 Identify options for improved consumer reporting
- D9.5 Formalise Costing Framework
- D9.6 Design Activity Based Funding Framework
- D9.7 Automated costing and performance metrics
- D9.8 Measurement Framework to support ACT Health Quality Strategy
- D9.9 Implement automation of standardised reporting functions
- D9.10 Design new performance reports
- D9.11 Design Analytics Strategy and Analytics Framework
- D9.12 Australian Institute of Health and Welfare data linkage
- D9.13 Pilot, implement and review new performance reporting
- D9.14 Recommendations for new local strategic indicators using Performance Measurement Framework
- D9.15 Business intelligence tool, including change management strategy
- D9.16 Continue automation of remaining standardised reporting functions
- D9.17 Build consumer reporting functionality within the Business intelligence tool

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.

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 Strategy over the next three years.

Table 1 Program of immediate activities and future activities for the data management domain

D1 – Data management		
Immediate activities completed	D1.2	**Developed data repository process monitoring reports** ✓ 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.
Immediate activities commenced	D1.1	**Developed specifications for data submission to meet external reporting requirements** ✓ 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.
		Align data repository with local and national submission specifications • Ensure that data field definitions align with national and local data submission requirements.
	D1.3	**Obtained approval for a new data repository by developing a business case** ✓ 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.

		Commenced development of a new data repository with well documented and validated processes
		• Work has begun to build this repository so that:
		   – 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.

		Build the new data repository ❖ Complete the build of the new data repository.

D1 – Data management		
Future activities	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		– 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.

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 Strategy over the next three years.

Table 2 Program of immediate activities and future activities for the data governance domain

D2 – Data governance		
Immediate activities completed	D2.1	**Developed and embedded data governance roles and responsibilities** ✓ Roles and responsibilities for data management are defined through the data management life-cycle 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: – 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.
	D2.3	**D2.3 Established Reporting Coordination Unit** ✓ Established a Reporting Coordination Unit and embedded it as part of the processes relating to data request and monitoring of reporting in Performance, Reporting and Data.
Immediate activities commenced	D2.2	**Established executive level leadership for data governance** ✓ 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. **Identified appropriate data governance committees** • 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. **Continuous oversight and review from governance committees** ❖ 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 – Data governance		
Immediate activities commenced	D2.4	**Commissioned an external independent Root Cause Analysis**
		✓ 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 36.
		Action findings and recommendations of the Root Cause Analysis
		❖ 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	**Developed data management frameworks, policies and processes**
		✓ 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.
		Finalise and embed the Data Management and Governance Framework
		❖ This framework will be widely communicated and embedded into day to day operations at all levels.
		Finalise and embed data custodian and ownership policies
		❖ Established a register of owners for various data sources maintained by ACT Health.
	D2.6	**Develop and implement data policies and procedures**
		• Data policies and procedures be developed and implemented to support data activities across ACT Health.
	D2.7	**Commenced pilots to embed data management plans across business units in ACT Health**
		✓ Management plans have been drafted and piloted with some business units.
		Rollout data management plans for all business units
		❖ 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	– 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.

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 Strategy over the next three years.

Table 3 Program of immediate activities and future activities for the data quality domain

D3 – Data quality			
Immediate activities completed	D3.1	**Reviewed and updated the formal quality assurance process**	
		✓ 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**	
		✓ 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.	
	D3.10	**Established the Data Management Group and associated Terms of Reference**	
		✓ This group will ensure that appropriate data and technologies are provided to inform insights, analysis and reporting requirements.	
Immediate activities commenced	D3.6	**Developing a Clinical Coding Strategy**	
		✓ 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.	
		Embed the Clinical Coding Strategy	
		❖ 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.	
	D3.8	**Commenced development of a Data Quality Framework in line with the ACT Government Office of the Chief Digital Officer**	
		✓ 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:	
		– to assess the data quality of data with reference to the specific purpose and requirement	
		– to assure that the data is fit for purpose.	
		Commenced development of a Data Quality Strategy	
		• 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.	
		Finalise and embed the Data Quality Framework and Strategy	
		❖ Once finalised the Data Quality Framework and Strategy will be socialised and embedded across ACT Health.	

D3 – Data quality		
Future activities	D3.3	**Embed a Data Validation Strategy to ensure transparency**
		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**
		❖ 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**
		❖ This will provide an initial assessment of ACT Health data quality and identify areas for improvements.
	D3.7	**Undertake a gap analysis of data collections**
		❖ Undertake reconciliations of data sets to identify any gaps in collection.
	D3.9	**Develop data quality statements for priority datasets**
		❖ 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**
		❖ Resubmit data for past years if gaps are identified in collection processes.
Impact of activities	−	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.

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 Strategy over the next three years.

Table 4 Program of immediate activities and future activities for the metadata management domain

D4 – Metadata management		
Immediate activities completed	D4.1	**Undertook a mapping exercise of reports to data items of source systems** ✓ 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** ✓ 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	D4.3	**Ongoing development and rollout of the Australian Institute of Health and Welfare data definitions** ❖ 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** ❖ Establish and maintain a metadata model to support the consistent interpretation of data from source systems to usage.
Impact of activities	–	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.

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 Strategy over the next three years.

Table 5 Program of immediate activities and future activities for the data security and privacy domain

D5 – Data security and privacy		
Immediate activities commenced	D5.1	**Reviewed and amended data access rights through audits** ✓ 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.
		Revised data access policies and protocols • 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.

		Build the new data repository and embed data access protocols
		❖ A data security management system (a part of the data repository) will log and register:
		  – 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).

		Undertake rolling data access audits ❖ A rolling audit program will be undertaken which will include a review of unusual patterns of access particularly systematic record changes.
Future activities	D5.2	**Develop and rollout staff training package for security and access** ❖ A training program will be developed to guide staff of the appropriate methods to access, store and disseminate data.
		Conduct ongoing staff training relating to data security and privacy ❖ 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** ❖ 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	–	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.

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 Strategy over the next three years.

Table 6 Program of immediate actions and future activities for the workforce domain

D6 – Workforce		
Immediate activities completed	D6.1	**Undertaken baseline assessment of internal data management workforce** ✓ A baseline assessment of staff numbers and skills mix has been performed. ✓ Position descriptions have been reviewed.
Immediate activities commenced	D6.2	**Developed a high level strategic plan for the Performance, Reporting and Data function** ✓ An assessment was undertaken in December 2017, which included developing a high level strategic plan including the division's vision and strategic objectives.
		Embed and implement the strategic plan ❖ Disseminate, embed and implement the division's vision and strategic objectives.
	D6.3	**Developed processes and communication to have staff performance plans in place** ✓ Processes and documentation guides for the development of staff performance plans are available for use by all Performance, Reporting and Data function staff.
		Ensure that all staff continue to have performance plans in place ❖ Develop and ensure completion rates for all staff performance plans in line with strategic objectives of the Performance, Reporting and Data Management Strategy.
	D6.4	**Developed orientation training packages for Performance, Reporting and Data staff** ✓ An orientation package for staff has been developed for the Performance, Reporting and Data functions.
		Further develop the Performance, Reporting and Data training packages ❖ 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.
	D6.6	**Completion of a training package for the Emergency Department Information System made mandatory prior to system access** ✓ Canberra Hospital implemented a mandatory requirement for staff to complete Emergency Department Information System training before receiving access to the system.
		Develop ACT Health data management training packages ❖ Develop and implement a training package in appropriate collecting, storage, access, and release of health information including security and ethics training.
Future activities	D6.5	**Benchmark internal workforce requirements** ❖ 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.

D6 – Workforce		
Future activities	D6.7	**Perform a gap analysis of the data management workforce** ❖ Develop an understanding of any workforce capability and capacity shortages (to be undertaken post D6.5).
Impact of activities		– 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.

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 Strategy over the next three years.

Table 7 Program of immediate actions and future activities for the communication domain

D7 – Communications		
Immediate activities completed	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).
		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.
Immediate activities commenced	D7.1	**Develop a comprehensive Communications Strategy and Stakeholder Engagement Plan** • Initial work has been undertaken on a comprehensive Communications Strategy and Stakeholder Engagement Plan, including how ACT Health informs, engages and empowers ACT Health stakeholders in relation to data and reporting.
		Roll out the Communications Strategy and Stakeholder Engagement Plan ❖ Following completion, the plan will be executed.
		Develop and distribute regular communications ❖ Develop regular communications to disseminate any new developments with regards to data sources or reporting.
	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.
		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	– 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.

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 Strategy over the next three years.

Table 8 Program of immediate actions and future activities for the change management domain

D8 – Change management		
Immediate activities commenced	D8.1	**Developed new policies to formalise change processes**
		✓ 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:
		– 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.
		Continue to socialise the change control policies and procedures
		❖ 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	**Established a Change Control Board**
		✓ 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.
		Continue to maintain ongoing oversight of change requests via the Change Control Board
		❖ Ongoing oversight of change requests by Change Control Board.
Impact of activities		– 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.

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 Strategy over the next three years.

Table 9 Program of immediate actions and future activities for the workforce domain

D9 – Information and Insights		
Immediate activities completed	D9.1	**Consulted with external stakeholders to produce a schedule/register of mandatory reports to meet reporting obligations**
		✓ 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.
		Identified essential internal and external reports such that mandatory reporting deadlines are being met more consistently
		✓ 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**
		✓ 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.
Immediate activities commenced	D9.6	**Began reviewing and evolving the existing Activity Based Funding Framework**
		• Initial work has progressed to review, renew and evolve the Activity Based Funding Framework, including the development of a draft framework.
		Design and embed the Activity Based Funding Framework
		❖ The Activity Based Funding Framework will identify the categories, classifications, issues and priority areas such that ACT Health can move towards Activity Based Funding.
	D9.8	**Commenced drafting the Measurement Framework to support the ACT Health Quality Strategy**
		• 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**
		• Initial work has progressed to draft the Analytics Framework.
		Design and embed an Analytics Strategy including an Analytics Framework
		❖ 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 – Information and Insights			
Immediate activities commenced	D9.12	**Progressed discussions with the Australian Institute of Health and Welfare to collaborate with national data linkage processes**	
		• Initial discussions with the Australian Institute of Health and Welfare have included compilation, provision and sharing of data.	
		Establish the linkage of ACT Health data with national processes	
		❖ Establish the linkage of ACT Health data through collaborating with the Australian Institute of Health and Welfare.	
Future activities	D9.5	**Revise the Costing Framework**	
		❖ 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.	
	D9.7	**Move towards automated costing and performance metrics**	
		❖ 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**	
		❖ 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**	
		❖ Design new operational performance reports for Activity Based Funding to inform clinical operations, costing and workforce.	
	D9.13	**Pilot, implement and review new performance reporting**	
		❖ 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**	
		❖ 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**	
		❖ Select and deploy a visual toolset and Business Intelligence platform.	
	D9.16	**Continue automation of remaining standardised reporting functions**	
		❖ Automation will allow skilled analytics staff to continue to use their time more efficiently on complex insight driven analytics.	
Impact of activities	– 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.		
	– 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.		

Note: For detailed information about ACT Health's essential and priority reporting, please refer to the System-Wide Data Review page on ACT Health's website at www.health.act.gov.au.

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 the ACT and surrounding areas, in particular patients and their families seeking real time information to make informed decisions about their healthcare.

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

D9 - Information and insights for consumers		
Immediate activities completed	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.
Immediate activities commenced	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.
		Identify options for improved consumer reporting ❖　Identify options and provide recommendations for consumer data availability and delivery.
Future activities	D9.17	**Build functionality within the chosen ACT Health Business Intelligence tool to address the reporting needs of consumers**
Impact of activities	–	This will ensure that insightful information and analysis is available in a user friendly and timely manner for ACT Health consumers.

Note: For a comparison of ACT Health's available consumer data and information compared with other states and territories (as available during the System-Wide Data Review), please refer to the System-Wide Data Review page on ACT Health's website at www.health.act.gov.au.

ENDNOTES

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[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

[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

[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