Health System & Service Reform in South Australia

Phase 1 – Insights from an Evaluative Case Study of Transforming Health

SA ACADEMIC HEALTH SCIENCE AND TRANSLATION CENTRE

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- Mr Kurt Towers, Director, Aboriginal Health, Northern Adelaide Local Health Network, SA Health
- Ms Nola Whyman, Manager, Aboriginal Health, Southern Adelaide Local Health Network, SA Health

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The evaluation focussed on the following five themes and Theme Leads were appointed to conduct the evaluation for these themes:

Population Health: Prof David Roder

The Patient Centred Experience: Ms Ellen Kerrins, Ms Simone Champion, Dr Lynne Raw

Staff Engagement: A/Prof Alison Jones, Ms Jane Coward

Clinical Outcomes: Prof Jon Karnon, Dr Gerry O'Callaghan

System Outcomes: Prof Mark Mackay, Dr Michelle Jones

Health Performance Council representatives, Ms Debra Kay and Mr Nick Cugley, contributed to the overall evaluation but were not involved in evaluating the five themes above or the writing of this report.

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Abbreviations

ACS	Acute Coronary Syndrome
AEAG	Aboriginal Expert Advisory Group
CALHN	Central Adelaide Local Health Network
CHSALHN	Country Health SA Local Health Network
FMC	Flinders Medical Centre
HCA	Health Consumers Alliance of SA Inc
HPC	Health Performance Council
LHN	Local Health Network
LMH	Lyell McEwin Hospital
MCAG	Ministerial Clinical Advisory Group
NALHN	Northern Adelaide Local Health Network
RAH	Royal Adelaide Hospital
nRAH	New Royal Adelaide Hospital
RGH	Repatriation General Hospital
SA	South Australia
SAAS	SA Ambulance Service
SA Centre	SA Academic Health Science and Translation Centre
SACESS	South Australian Consumer Experience Surveillance System
SALHN	Southern Adelaide Local Health Network
TH	Transforming Health
TH CCEC	Transforming Health Consumer and Community Engagement Committee
WCHN	Women's and Children's Health Network

1. Executive Summary

Transforming Health was a major state government initiative involving healthcare reform in response to findings that the current system was not delivering consistent quality outcomes across all services and sites and to significant cuts to Commonwealth funding in May 2014. SA Health commissioned the SA Academic Health Science and Translation Centre (SA Centre) to undertake evaluation of system changes under Transforming Health.

The evaluation was initiated in in August 2016. The Transforming Health Evaluation Working Group was convened in October 2016 with an independent Chair and a targeted, expertise based membership, to provide advice and oversee the establishment of an evaluation framework and implementation of an evaluation and reporting process. Progress was reported to the SA Government's Legislative Council Select Committee on Transforming Health (Select Committee on Transforming Health, 2017) on 26 May 2017.

The evaluation was very limited compared to the extent of changes involved in Transforming Health and many aspects were unable to be evaluated. With a timeframe of twenty months and a limited budget, it was only possible to investigate a very small proportion of the complex, Transforming Health program.

A pragmatic, fit-for-purpose Case Study approach was adopted to investigate Clinical Projects that had been implemented for a sufficient length of time to have generated measurable outcomes before the end of 2017. The following four projects met this criterion:

- Acute Coronary Syndrome (ACS) Emergency Department Pathway
- Stroke Model of Care
- Rehabilitation Services
- Orthogeriatric-Acute Hip Fracture Model of Care

A Program Logic was developed to chart the course of the Case Study. It mapped out the original business case for reform under Transforming Health, short, medium and long term outcomes and relevant stakeholders.

Identifying the following five Key Themes helped to focus the Case Study:

- **Population Health**
- **The Patient Centred Experience**
- **Staff Engagement**
- **Clinical Outcomes**
- **System Outcomes**

The methodology involved triangulating quantitative data from *Population Health, Clinical Outcomes* and *System Outcomes Themes* with qualitative data from T*he Patient Centred Experience, Staff Engagement* and *System Outcomes Themes*. Quantitative data were used from relatively large samples to measure standardised outcomes and for controlled comparisons. Qualitative data were generated from stories and interviews with patients, carers and staff, to add depth, detail and nuance to quantitative findings through examining issues that individuals encountered.

1.1 Key Results

Population Health

The Case Study began by looking at the whole health system from a ***Population Health*** focus in order to provide a background of the population health perspective prior to Transforming Health. With South Australia not having a comprehensive data set that could provide this background information, the Working Group saw the opportunity to generate a subset of data identifying baseline levels of health and time trends and to assist service planning and establish benchmarks for later evaluation. Baselines and trends presented were derived from analyses of mortality, hospitalisation, health-related registries and databases, and self-reported survey data for SA as a whole, priority sub-groups, and where relevant, health-service sectors (public and private). Results showed that SA generally has very similar life expectancies at birth, similar mortality and hospitalisation rates, pregnancy outcomes, and cancer survival outcomes to Australia as a whole. SA has experienced equivalent reductions over time in age-standardised death rates from all causes of death combined. However, there are disparities within SA by remoteness of residence, socio-economic status, and Aboriginal status and each disparity warrants individual interpretation and decision-making as to likely causes and amenability to remedial action. In general, this would require further, more detailed analyses to determine causes and facilitate service targeting. In that context, the data provide a "road map" to consider in future action and evaluation plans.

Patient Centred Experience

The Theme used quantitative data about the patient centred experience in 2016 from the South Australian Consumer Experience Surveillance System (SACESS) Survey, together with qualitative data from Focus Groups with nineteen patients and carers. Results from the Focus Groups showed that there was an even divide between negative (52%) and positive (48%) responses to questions about their experiences within the four models of care investigated. Information from the Focus Groups was in general agreement with results from the SACESS Survey, except with regard to Respect for Patients' Expressed Needs. This indicator for the Survey scored well above the State benchmark, whereas there were high numbers of both positive and negative responses from Focus Group participants in this area.

Patients reported that things that were done well in the four models of care included provision of a positive therapeutic environment and communication between different staff disciplines to coordinate care. Areas for improvement included transfers between hospitals, discharge from hospital, open communication between staff and patients/carers so that knowledge and information flows freely, and the process of informing patients and carers of their rights and ways to provide feedback.

The findings that patients treated under the same model of care and in the same therapeutic environment could have very different care experiences, sometimes very positive and sometimes very negative, suggests that there is opportunity to explore and improve consistency of care processes within the models of care investigated.

Staff Engagement

Interviews from thirteen staff, including clinicians and Project Managers formed the basis for investigating the ***Staff Engagement*** Theme. The question investigated was "Did Transforming Health provide an opportunity for staff for professional growth, and for staff to specifically develop their leadership skills, resilience to change, and ability to collaborate across units?" For some staff, the Transforming Health agenda seemed to have provided legitimacy and an authorising environment that had previously been absent. Improved collaboration was reported in some areas, with people being brought together in multidisciplinary teams that were able to link in the specialists and get everyone doing the same thing at the same time.

An ongoing concern reported by staff interviewed was whether any initiatives were sustainable beyond the urgency and mandate created by Transforming Health. The Project Managers who were interviewed often provided useful insights into how future governance structures and resourcing could facilitate broader cross disciplinary, cross specialty or cross Local Health Network (LHN) collaboration. There was clearly a strong affiliation among staff in the LHNs to their own LHN and this tended to override any sense of belonging to SA Health as a state-wide entity. This warrants further exploration and specific recommendations to understand how more integrated, system-wide collaboration could be achieved.

Clinical Outcomes

The ***Clinical Outcomes*** Theme aimed to assess the extent to which Transforming Health delivered consistently high quality health care across all metropolitan hospitals, providing better value and decreased costs to the State budget. Care pathways for Acute Coronary Syndrome (ACS) Emergency Department Pathway and Stroke model of care were selected as exemplars.

For ACS presentations, statistically significant reductions in mortality at 30 days and 90 days were observed in the first quarter of 2017 compared to the first quarter of 2015, building on non-statistically significant improvements in the first quarter of 2016. There were no statistically significant differences in the other outcomes, though average length of stay decreased slightly in 2017.

For Stroke, non-statistically significant increases in mortality and readmissions were observed in 2016. These outcomes returned to levels similar to 2015, in the first quarter of 2017. Length of stay showed a downward trend, building to a statistically significant reduction by 2017. Separation costs remained similar across all three time periods. There was some indication of reduced variation in outcomes between hospitals over time, though the numbers of stroke patients presenting at individual hospitals provided little power to detect real differences.

The conclusion for the *Clinical Outcomes* Theme was that the reported results capture the early effects of two of the new models of care implemented as a result of the Transforming Health initiative, and indicate movement of clinical outcomes in the desired direction. Regular updates of the reported analyses, across a wide range of clinical areas, will better represent the effects of Transforming Health and inform further, continuing improvements in the South Australian health system.

System Outcomes

The ***System Outcomes*** Theme investigated whether Transforming Health has provided an opportunity for system change across the metropolitan hospitals. It specifically explored how Transforming Health has:

- improved the flow of patients through the system
- improved the flexibility of delivery of services in the system to manage variation that occurs in the system
- promoted innovation to improve system performance
- enabled the system to use different types of evidence to deliver high quality patient care.

The findings confirmed that variation in process existed and that changes in the system and at individual sites occurred, including improved patient flow. Attribution of the changes to Transforming Health, however, was not possible. It is important to recognise that variability can and should be modelled. To embark on any significant change without such modelling means that variation cannot have been reasonably accounted for and nor can a range of possibilities.

In future, it is hoped that SA Health employs simulation or other appropriate modelling tools prior to any such significant reform.

Several clinical innovations were reported by the clinical leads interviewed, all of whom were concerned about data access and the use of data and health information to either improve health practice and outcomes or monitor their outcomes. Rivalry between sites was evident especially in relation to the level of infrastructure and resources distributed through the implementation of Transforming Health. All sites interviewed mentioned the value of professorial positions including partnerships between the hospital and South Australian Universities to promote innovation and evidence based practice.

Limitations to the System Outcomes evaluation include the short timelines, delays with ethics approvals, focus on only one model of care in the quantitative component and small sample size in the qualitative component (n=6).

1.2 Recommendations

The Transforming Health initiative was an early and bold attempt to generate change within a (relatively conservative) system. It has worked in part, but most importantly the Evaluative Case Study has generated a list of recommendations, based on the evidence synthesised from the evaluation, to guide further action. The results have also been validated by what existing external evidence there is from other reviews of large-scale system change activity.

The recommendations include:

Domain 1: Data driven and informed service improvements

- SA Health, LHNs and PHNs should consider data, such as in the Population Health Report, when aligning priorities.
- Increase capacity for the analysis and reporting of contemporary clinical and cost data to supoort the timely identification of priority areas for improvement.
- Consider governance processes which embrace transparency of data and ability to compare across sites.
- Consider ways to routinely collect and integrate patient reported outcomes and experience with clinical data to understand the full picture.
- Ensure all staff voices are heard in the system, for example, introduce consultation and feedback process around reported performance data that involve all staff.

Domain 2: Governance arrangements

- Pay attention to building and sustaining trusting relationships to lead the system changes.
- Clarity around what is disclosed and how it is shared.
- Consider the organisational models which separate the operational activity of health departments with organisations established to lead system innovations and improvements.
- Be clear what is in and out of scope and actively manage engagement processes.

Domains 3 & 4: Communication and Engagement

- Build on the standard setting and models of care workshops to promote patient-centred journeys.
- Actively celebrate achievements.
- Ensure clarity, consistency and transparency for the case for change and use appropriate language.
- Ensure communication and engagement processes are open, transparent and engender trust.
- Consider how central messages are translated appropriately at local level.
- Actively address groups that wish to remain separate or apart from main initiative.
- Value and respect consumer feedback and act upon it.

Domain 5: Clinicians' responsibilities/roles

- Invest in ongoing benchmarking of population profile and use this to set priorities.
- Invest in ongoing development of clinical data systems that can be used by clinical teams in real time.
- Engage more explicitly with continuous quality improvement and simulation techniques to guide service improvements.
- Commit to ongoing leadership development and education of clinical staff. Acknowledge the importance of leadership to change negative or resistant cultures.
- Actively pursue university-clinical partnerships.
- Understand what a patient-centred system looks like and actively work toward achieving it.

These recommendations can be used to refine future implementation and evaluation strategies around service redesigns and improvements in models of care.

SA Health has stated that it has an ongoing commitment to evaluation as described by the then Minister for Health "…to provide the evaluative lens, including a longitudinal study of the impact of Transforming Health" and to "undertake the ongoing evaluation of our transformative changes" (Minister for Health, 2015a, p. 12).

Supporting the coordination of this evaluative process in cooperation with the Evaluation Working Group and the SA Centre was a demonstration of this commitment. It is anticipated that a 'Phase 2' of this evaluation could investigate aspects of Transforming Health that were not able to be covered in Phase 1. This would be a valuable outcome for all stakeholders in South Australia.

The SA Centre and the authors of this report want the findings of this report to be used as the catalyst to ensure that evaluation activities are incorporated into the design of future health system and service reform and not undertaken as an add on. Additionally, the recommendations from this report must be used to guide health service redesign in SA now and in the future. SA Health is poised to take that step.

2. Background to Transforming Health and the Evaluative Case Study

2.1 The case for transformation of the SA Health system

In 2014, evidence was emerging that the SA Health System had areas of excellence but was not delivering consistent quality outcomes across all services and sites. There were also significant cuts to Commonwealth funding in May 2014 meaning that the SA Health system needed to think differently about how to provide a healthcare system that met the future needs of the South Australian population.

Consultancy companies were commissioned to undertake discrete aspects of the work. McKinsey & Company worked with the Clinical Advisory Committees, set up in June 2014, to develop principles and standards, and to conduct a more detailed analysis of specific data from SA Health Clinical Service Planning (Phase 1: September 2013 to November 2015, Phase 2: February to March 2014, Phase 3: June to October 2014 and Phase 4: October 2014 to January 2015). Clinical Advisory Committees comprised medical, nursing, midwifery, and scientific and allied health representation.

Deloitte partnered with SA Health to upskill staff for implementation (October 2015 to April 2017), and Ernst & Young's independent project management office was recruited to monitor implementation of changes and the progress being made. (November 2015 to November 2017).

The Clinical Advisory Committees developed 284 Clinical Standards of Care which, at the time, were deemed necessary to provide a sustainable and quality based health care system to meet the future needs of SA. The initial business case, approved by SA Cabinet in March 2015, indicated that 52 of these 284 standards were not achievable with the existing health service configuration and this informed the need to transform the health care system.

Transforming Health was the name given to the series of system-wide changes that were planned. It was a major state government initiative involving healthcare reform in response to the identified issues. Rationale for the need for reform (Minister for Health, 2015a) included:

- the changing population profile across the State, with an ageing and diverse population that faces different challenges in accessing appropriate healthcare
- advances in technology and breakthroughs in medical science which need to be harnessed in order to deliver consistent quality care
- features of the current health system:
  - too many deaths occurring in our hospitals
  - long waiting times for discharge or placement
  - too many transfers between hospitals
  - unable to meet some national standards
  - a risk to the financial sustainability of our healthcare

A full description of the need for change is available in the report *Delivering Transforming Health – Our Next Steps* (Minister for Health, 2015a).

2.2 Planning and Consultation

In August 2014, a Clinical Ambassador was appointed as Clinical Lead for the Transforming Health program.

Key planning and consultation events were held in 2014-15 **(Table 1)**, including papers released by the Minister, and the Transforming Health Summit attended by over 600 staff and consumers.

The work begun by the Clinical Advisory Committees in 2014 was continued by the Ministerial Clinical Advisory Group (MCAG) set up in March 2015. The role of the group, which was chaired by the Clinical Ambassador, was to undertake provision of:

- clinical governance for statewide services; clinical leadership for the establishment of fully networked services; and implementation of consistent clinical guidelines and standards of care
- input into and clinical leadership of service delivery changes required for the new metropolitan wide configuration
- input into and clinical leadership of new models of care and new hospital models
- input into and clinical leadership for enhance appropriateness and performance improvement plan
- input into any capital redesign
- support for stakeholder engagement (staff and community).

In July 2015, the Health Consumers Alliance of SA Inc (HCA) established the Transforming Health Consumer and Community Engagement Committee (TH CCEC), with support from SA Health. The purpose of the Committee was to provide SA Health with broad, strategic and representative consumer and community engagement as the peak consumer and community advisory body for Transforming Health.

In August 2016,The Aboriginal Expert Advisory Group (AEAG) was formed to advise the MCAG on how to ensure the needs of Aboriginal people, including those employed by SA Health, were addressed under Transforming Health.

Table 1. Transforming Health Consultation 2014-15

Date	Consultation
June-October 2014	Clinical Advisory Committees (Medical, Nursing & Midwifery, and Allied & Scientific Health) worked together to develop: • six quality principles: patient centred, safe, effective, accessible, efficient, equitable • 284 Clinical Standards: health services could not meet 52 of these under their current configuration
17 October 2014	*Discussion Paper* was released for wide consultation, which included 39 community events over the following month. More than 2000 submissions were received and close to 5000 staff and community members were involved in the consultation process.
28 November 2014	More than 600 people attended the Transforming Health Summit and agreed that transformation was needed to deliver the best quality healthcare first time, every time, beginning with our metropolitan hospital system
3 February 2015	The *Delivering Transforming Health Proposals Paper* (Minister for Health, 2015b) was released for feedback from staff and clinicians; the community; unions; consumer representative organisations; research, training and education providers; and non-government organisations.
March 2015	*Delivering Transforming Health – Our Next Steps* (Minister for Health, 2015a) was released, outlining initial decisions, a commitment to ongoing engagement, & timelines of the first changes to improve the healthcare system.

2.3 Implementation

Implementation of Transforming Health commenced in March 2015.

Key Events for Transforming Health and its evaluation are shown in **Figure 1**.

The standards developed by the Clinical Advisory Committees provided guidance on achieving consistent quality care and were expected to be addressed through models of care projects and service reconfiguration.

The focus of changes was in the metropolitan, public hospital system, with the aim of ensuring that it was delivering consistent quality care before the full spectrum of the health and community sector, including country and public health services, was tackled. In the Discussion Paper it was stated that “Transforming Health must be a whole-of-system transformation but we have to start where the impact is greatest – our metropolitan hospitals.” (Minister for Health, 2014, p. 14)

Figure 1. Key Events for Transforming Health & Evaluation

Early 2014

Evidence that SA Health System had areas of excellence, but not delivering consistent quality outcomes across all services and sites. Significant cuts to Commonwealth funding.

June – Oct 2014

Clinical Advisory Committees set up in June 2014; worked with McKinsey & Company to identify Quality Principles and Clinical Standards of Care.

August 2014

Clinical Ambassador appointed.

March 2015

- Initial business case approved by Cabinet.
- MCAG: first meeting. Eight models of care identified to address Clinical Standards not being met.

June 2014 – March 2015

Consultation with staff and community:

- October 2014: Discussion Paper released
- November 2014: TH Summit
- February 2015: Delivering Transforming Health Proposals Paper (Minister for Health, 2015b) released
- March 2015: Delivering Transforming Health – Our Next Steps (Minister for Health, 2015a) released

July 2015

Transforming Health Consumer and Community Engagement Committee (TH CCEC) formed.

November 2014 – May 2015

Health Consumers Alliance of SA Inc (HCA) held two consumer and community forums – over 150 people informed HCA's work on TH.

August 2016

- Aboriginal Expert Advisory Group (AEAG) set up.
- Transforming Health Evaluation Workshop held.
- Evaluation to be conducted under auspices of SA Translation centre.

March 2017

HPC released the first of its bi-monthly Monitoring the implementation of Transforming Health Indicator Reports.

May 2017

TH Evaluation Working Group reported to SA Parliamentary Select Committee for TH.

September 2017

Move to new Royal Adelaide Hospital.

October 2017

Opening of Jamie Larcombe Veterans' Mental Health Centre.

November 2017

Decommissioning of Repatriation General Hospital completed.

30 Nov 2017: Transforming Health officially finished.

2016 – 2017

Implementation of clinical projects, some continuing in 2018:

- July 2016: ACS Model of Care Stage 1
- July 2016 – July 2017: Orthogeriatric-Acute Hip fracture Model of Care
- October 2016 – July 2017: Rehabilitation Services
- March 2017 – January 2018: Stroke Model of Care

Oct 2016 – June 2018

Monthly meetings of Transforming Health Working Group.

May 2018

Report to SA Health: Health System & Service Reform in South Australia – Insights from an Evaluative Case Study of Transforming Health.

7 June 2018

Seminar: Health System & Service Reform in South Australia.

The Leadership Program (see **Section 4.4**) and data analytics (see **Section 2.5**) were enablers for the Transforming Health Program, and the Transforming Health structure was based on changes in three main areas (Keefe, 2017):

- Relocation and consolidation of services at appropriate sites to improve patient access and flow in metropolitan hospitals. This involved footprint reconfiguration with building works to enable these moves to occur.
- Design and implementation of evidence-based, state-wide models of care to improve consistency and quality of care across the system.
- Improved productivity and cost efficiency through, for example, timely discharge to reduce length of stay, increasing day surgery rates and improving asset utilisation such as for operating theatres, reducing cancellation rates and eliminating starts.

During 2015-16, the following eight clinical improvement projects were identified to address the Clinical Standards that were not being met:

- Acute Coronary Syndrome (ACS) Emergency Department Pathway
- Stroke
- Rehabilitation Services
- Orthogeriatric- Acute Hip Fracture
- Seven Day Allied Health Services (Stage 1)
- After Hours Senior Clinical Cover
- State-Wide Paediatric Surgical Governance
- Opening of the new Veterans' Mental Health Precinct, The Jamie Larcombe Centre, and Veterans' Mental Health Model of Care.

As Transforming Health activities centred on metropolitan acute hospitals, changes were not likely to have a large impact on consumers in the Women's and Children's Health Network (WCHN) nor in the Country Health SA Local Health Network (CHSALHN), although consumers were affected if they had to be transferred to a metropolitan hospital for treatment.

The Minister for Health announced in July 2017 that the Transforming Health program would end with the opening of the new Royal Adelaide Hospital (nRAH), and the closure of the Repatriation General Hospital (RGH). Transforming Health finished officially on 30 November 2017, but models of care continue to be implemented across all relevant LHNs.

2.4 Consumer and Community Engagement in Transforming Heath

2.4.1 Transforming Health Consumer and Community Engagement Committee

The Health Consumers Alliance of SA Inc (HAC) hel two consumer and community forums. The first was held in November 2014, and the second in May 2015, with over 150 people informing HAC's work on Transforming Health, following SA Health's release of the paper *Delivering Transforming Health – Our Next Steps* (Minister for Health, 2015a) in March 2015.

In July 2015, following recommendations from the second forum, HCA established the Transforming Health Consumer and Community Engagement Committee (TH CCEC), with support from SA Health. Committee members were selected via an application and interview process, with organisations representing priority target populations also being asked to nominate a representative.

The mix of individual and representative members on the TH CCEC was found to be beneficial, with individual members taking a more prominent role in engaging in the model of care working groups, and the representative members providing the linkages with LHNs, Primary Health networks (PHNs) and priority populations.

The purpose of the TH CCEC was to provide SA Health with broad, strategic and representative consumer and community engagement as the peak consumer and community advisory body for Transforming Health. The Committee was connected to the Transforming Health MCAG through the Committee Chair, as a member of MCAG.

The TH CCEC developed a work plan with a focus on:

- Consumer and community engagement
- Access
- Vulnerable populations
- Information provision, community education and health literacy
- Measures, indicators and evaluation
- Primary health and prevention.

The key driver for the work of the Committee was consumer-centred care and their expectations were for early and authentic consumer engagement in Transforming Health, with effective and timely communications and access.

In July 2017, when plans for ending the Transforming Health program were announced, the TH CCEC began to conclude their work with the development of an activities report (Health Consumers Alliance of SA Inc, 2017). The purpose of the report was to document the work of the Committee, the experience of its members and recommendations for consumer engagement in future health reform.

Key outcomes for TH CCEC from the report included:

- The biggest challenge was that consumers were not engaged right from the beginning of Transforming Health, and that it took 12 months to clarify the TH CCEC's role and purpose.
- The opportunity for members of the TH CCEC to sit around the table with some of the decision makers in SA Health was integral to its success.
- A key impact of the Committee was the change in the relationship between consumers and SA Health at the strategic level. The robust, challenging and respectful relationships that have developed through this Committee have flowed on to increase consumer engagement in other areas of SA Health.
- TH CCEC members were clear that health consumer engagement in the future needs to start from the beginning and have a clear purpose, with links to real decision making.

2.4.2 Aboriginal Expert Advisory Group

In order to facilitate consultation and engagement of Aboriginal people with Transforming Health, the Aboriginal Health Council was asked to nominate a member for the TH CCEC.

However, it was also advised that a broader consultation and engagement in Transforming Health would be more effective, and HCA supported this broader engagement.

The Aboriginal Leaders Forum held in November 2015 advocated for consultation and engagement through an Aboriginal Expert Advisory Group (AEAG) and this was supported by SA Health.

In June 2016, an Aboriginal representative was co-opted by MCAG; however, this appointment was brief and once vacated, was never filled as it was decided that a more effective link with MCAG would be through establishment of the AEAG.

It was in August 2016 that the AEAG was set up, and its role was to advise MCAG on how to ensure the needs of Aboriginal people (including those who are SA Health staff) were addressed under Transforming Health.

Outcomes of the AEAG are discussed in Section 4.1.

2.5 Other monitoring and evaluation of Transforming Health

When the evaluation of Transforming Health was initiated in August 2016, other monitoring and evaluation was being conducted by SA Health and external organisations.

SA Health implemented the use of QuickBase, a project monitoring and evaluation management tool that was introduced in June 2015 to monitor the implementation of projects by providing data for Project Managers and others registered to use the program.

SA Health also introduced the Quality, Information and Performance Hub (QIPH) to provide timely access to a clearly defined set of clinical, safety, quality and performance information. This information is gathered and consolidated into meaningful indicators and measures to be used by clinicians and the executive. QIPH was introduced in October 2017 initially for use with the Stroke and Orthogeriatric – Acute Hip Fracture Clinical Projects.

Ongoing small scale monitoring and evaluation of health reforms is conducted by clinicians to provide feedback to staff at the LHN level.

The following internal and external reports have also provided information about the progress of Transforming Health:

- Measuring Consumer Experience Reports: SA Health uses the South Australian Consumer Experience Surveillance System (SACESS) to survey consumers about their experiences in metropolitan and country hospitals. In 2016 there were responses from 2310 consumers (Grant, Khan, & Taylor, 2017). The results from SACESS are used to guide policy development, help SA Health reach and exceed its benchmarks and inform staff training programs.
- Reports released bimonthly by the Health Performance Council (HPC): "Monitoring Transforming Health (2015-2017) Indicator Reports." Further details of HPC's monitoring and copies of their bi-monthly reports can be found on their website: www.hpcsa.com.au. These HPC reports informed the SA Centre's Transforming Health Evaluation, but should not be read to be endorsing recommendations from the evaluation.
- Auditor General's Reports (2015-16 and 2016-17) which cover aspects of governance, financial management arrangements and contract management.

Summaries of the most recent editions of these reports are provided in **Table 2** .

The existing monitoring and evaluation of the progress of Transforming Health provided a basis for the Evaluative Case Study and its investigation of short term outcomes, aspects of Transforming Health that worked well and did not, and for attempting to identify reasons for success or failure and learning from both.

Table 2. Summary of other monitoring & evaluation activity around Transforming Health

SOUTH AUSTRALIAN CONSUMER EXPERIENCE SURVEILLANCE SYSTEM (SACESS) SURVEY CONDUCTED BY SA HEALTH

Surveys consumers about their experiences in metropolitan and country hospitals.

Results 2016: responses from 2310 consumers (68.6% response rate) (Grant et al., 2017).

SA's public hospitals scored above average in the following care domains:

- Treated with respect and dignity
- Nurses
- Pain control
- Privacy
- Doctors
- Cleanliness

Domains not meeting the standard included:

- Consistency and coordination of care
- Involvement in decision-making
- Food
- Discharge information
- Involvement in care and treatment

(Continued) Table 2. Summary of other monitoring & evaluation activity around Transforming Health

BIMONTHLY REPORTS RELEASED BY HEALTH PERFORMANCE COUNCIL (HPC)

Reports from March – November 2017 monitored changes in patient access and equity before and after Transforming Health implementation, prioritising indicators that may show unwarranted widening of health outcomes gaps between specific populations, particularly vulnerable groups. The 5th and latest edition released in November 2017 reported on results between the first quarter 2007-08 and the first quarter 2017-18:

- Average length of overnight stay at metropolitan Adelaide public acute hospitals declined 15.2%, from 6.6 to 5.6 days (latest national figure is 5.4 days).
- The percentage of in-hospital deaths in metropolitan Adelaide public acute hospitals fell, from 1.6% to 1.4% (latest national figure is lower at 1.0%).
- The percentage of inpatients transferred between hospitals rose, from 4.7% to 6.2%. This is higher than the latest national figure of 5.6%.

A 6th edition is anticipated to be released in late May 2018 and will be the final release of HPC's series of Transforming Health indicator reports. It will be an update of the previous five reports and will also include consumer experience and staff engagement measures.

HPC's reports are available for download from their website: www.hpcsa.com.au

AUDITOR GENERAL'S REPORT 2016-2017

Transforming Health 2016-17	Target	Actual	Variance
	$'million	$'million	$'million
Gross Savings	118.3	16.3	(102.0)
Gross Expenditure	66.0	33.5	32.5
Net Savings (Cost)	52.3	(17.2)	(69.5)

The 2016-17 net savings target of $52.3 million was not achieved.

Instead the program resulted in a net cost of $17.2 million.

Gross Savings of $118.3m was the planned financial benefit from the original business case.

The planned, strategised financial benefit from SA Health & the LHNs was $81m: actual benefit being $16.3m.

Gross expenditure included operational costs (implementing new models of care etc.). It did not include capital expenditure (Jamie Larcombe Centre, new palliative care centre at FMC etc.) nor did it include the new RAH which was not part of Transforming Health.

SA Health Program Delivery Support Office advised that the shortfall between target and actual financial benefits was mainly due to:

- Delays in bed configuration and FTE reductions due to the volume of consultation required with union groups to resolve a number of industrial relations matters
- Financial benefits modelling was based on 2014-15 activity data with no allowance for growth. SA Health has 2.7% growth in activity since 2014-15
- Some models of care implemented to support Transforming Health required LHNs to reinvest from within existing resources, impacting on the realisation of benefits.

2.6 Background to the Evaluative Case Study

SA Health commissioned the SA Academic Health Science and Translation Centre (SA Centre) to bring together the state's academic, research and health care delivery agencies to advance translation of evidence into clinical care for improved health outcomes (Minister for Health, 2015a).

As part of its role, the SA Centre was to support the Transforming Health agenda through the provision of evidence-based and evaluation-oriented strategic advice, and undertaking the ongoing evaluation of system changes under Transforming Health, to ensure positive progress was being made in improving quality of care outcomes. The SA Centre was "…to provide the evaluative lens, including a longitudinal study of the impact of Transforming Health" and to "undertake the ongoing evaluation of our transformative changes" (Minister for Health, 2015a, p. 12).

However, evaluation was not included as part of the planning of the Transforming Health program in 2014-2015. It was initiated when a joint SA Centre/SA Health Evaluation Workshop was held, in August 2016, to inform the development of an evidence-based Evaluation Framework for Transforming Health.

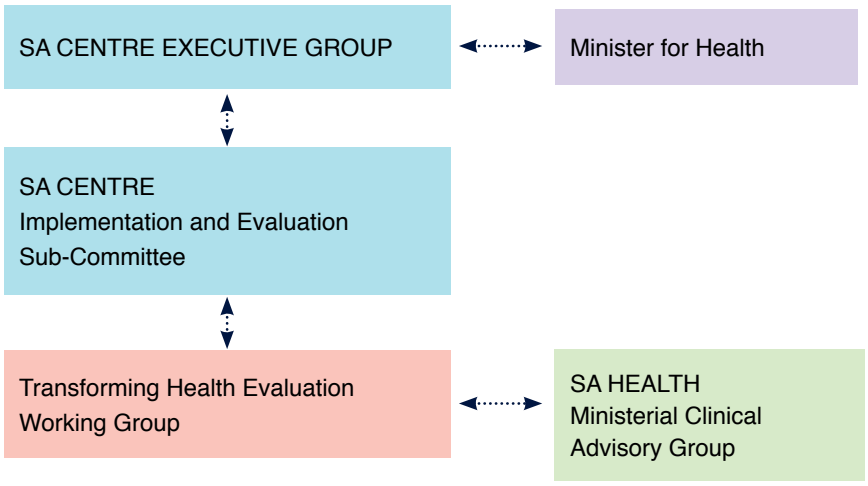
Workshop participants included stakeholders from MCAG, the SA Centre Implementation and Evaluation Sub-Committee, peak Transforming Health Consumer Committees, HPC, the SA Health Clinical Data Committee and other key SA Health staff.

It was agreed at the workshop that the approach to evaluation should be patient-centred, encompass the end-to-end patient journey and consider the triad of workforce capacity, system process and health outcomes (SA Health, 2016). Discussions were initiated regarding what was currently monitored, identifying and prioritising key evaluation questions, measures, information and data requirements (qualitative and quantitative), gaps in data sources as well as the recommended methodology to answer these evaluation questions.

Following this, the Transforming Health Evaluation Working Group was convened with an independent Chair and a targeted, expertise based membership, to provide advice and oversee the establishment of an evaluation framework and implementation of an evaluation and reporting process.

Governance involved the Working Group reporting directly to SA Centre's Implementation and Evaluation Sub-Committee, with input and advice as required from SA Health's MCAG and other expert groups (**Figure 2**).

Figure 2. Governance of the Transforming Health Evaluation Working Group



Members of the Working Group took on the tasks assigned to them in addition to their substantive roles in universities and health care organisations. Any conflicts of interest were identified and no members were remunerated for any work undertaken.

The Working Group held its first meeting in October 2016 and has met monthly since then, with membership comprising the Transforming Health Clinical Ambassador and representatives from the SA Centre, university academics, clinicians, as well as representatives from SA Health's Medical Education and Training Unit, Data and Reporting Services, and Organisational Development. An Evaluation Coordinator commenced in March 2017 and worked under the direction of the Working Group.

On 26 May 2017, a report on the Transforming Health Evaluation was presented to the SA Government's Legislative Council Select Committee on Transforming Health (Select Committee on Transforming Health, 2017). Professor Steve Wesselingh, Chair of the SA Centre's Executive Group, and Professor Alison Kitson and Professor David Roder from the Evaluation Working Group provided an overview of the evaluation. Dialogue with the Select Committee covered evaluation as one of the priority areas for the SA Centre, and the progress of the Transforming Health Evaluation. The subsequent response to *Questions on Notice* included supplying the Program Logic and Evaluation Framework to the Select Committee.

3. What we did: evaluation approach and limitations

This section will describe how the Case Study approach was decided upon, the development of the Program Logic and how it was used to develop the Case Study. The rationale behind choosing the five themes for focusing the Case Study, and what was able to be evaluated within the limitations of time and budget, are discussed.

3.1. The Case Study approach and rationale for the themes

When the Transforming Health Evaluation was initiated in August 2016, the scope of the evaluation was an important factor to consider when deciding on what was the best approach to adopt. **Figure 3** shows the processes that were in existence around Transforming Health.

The scope of the evaluation was defined by a timeframe of twenty months and a limited budget. This meant that the evaluation was limited to investigating a very small proportion of Transforming Health, which was implemented to bring about change in SA Health.

With these limitations in mind, the Working Group decided that rather than answering the question “Did Transforming Health work?” it was more achievable to answer the question “Which of the aspects of Transforming Health, evaluated within the Case Study, worked and why?”

An evaluation methodology was needed that suited the complex, adaptive system within which Transforming Health was being implemented, and that would take into account the sensitivities around any health system. The evaluation needed to connect with people who were influencers and decision makers within SA Health, as well as with other stakeholders, including staff and consumer patients and carers.

It was therefore decided to adopt a Case Study approach that was a hybrid of traditional evaluation and evaluation that fitted the limitations of the scope of the task (Owen & Rogers, 1999). The Case Study was summative in the sense that it aimed to provide information about the effectiveness of the program which officially ended in November 2017, although some of its changes are still being implemented. It was partly “Interactive” in nature and partly an “Impact Evaluation” in that it provided information about how the changes were progressing, whether the approaches to delivery were making a difference and how the implementation could be more effective (Liamputtong, 2009) (Owen and Rogers 1999).

One of the first tasks for the Working Group was to develop a Program Logic for the Case Study. A Program Logic is an important evaluation tool that provides a framework to facilitate thinking, planning and communication about program objectives and actual accomplishments (WK Kellog Foundation, 2004).

The Program Logic for the Case Study (**Table 3**) charted the course of the evaluation by identifying the original business case for reform under Transforming Health, and short, medium and long term outcomes. It also illustrated the stakeholders involved and helped to create explicit understanding of the challenges of the Case Study, including which outcomes could be investigated.

Using the Program Logic, the Working Group identified the following five Key Themes to direct the focus of the Case Study, and appointed Theme Leads for each investigation:

- Population Health
- The Patient Centred Experience
- Staff Engagement
- Clinical Outcomes
- System Outcomes

Investigations within these five themes were limited to Transforming Health Clinical Projects that had been implemented for a sufficient period of time to generate short term outcomes. These included the following four of the eight projects that were commissioned during 2015-16:

- Acute Coronary Syndrome (ACS) Emergency Department Pathway
- Stroke Model of Care
- Rehabilitation Services
- Orthogeriatric-Acute Hip Fracture Model of Care

Table 4 summarises the five theme investigations including the rationale for choosing each of the five themes, data used and the models of care investigated.

The reason why the Case Study began by looking at the whole health system from a population health focus was to provide a background of the population health perspective prior to Transforming Health. With SA not having a comprehensive data set that could provide this background information, the Working Group saw the opportunity to generate a subset of data identifying baseline levels of health, time trends and disparities. The utility of the data will be realised in subsequent evaluations undertaken by the SA Centre on service improvements.

The *Patient Centred Experience* and *Staff Engagement* Themes were chosen as these are two key groups of stakeholders whose experiences can firstly provide guidance and understanding about the status quo when investigating the need for reform, and secondly provide insight into the changes occurring under Transforming Health, especially within the four models of care that were investigated.

The Clinical and *System Outcomes* Themes were chosen as data around these outcomes routinely drive service reform and inform resources needed. Results from these themes enabled the triangulation of data around clinical and system changes during implementation of the models of care, with the experiences of patients and staff, to provide an overview of the proposed Transforming Health reform.

The Themes investigating Population Health, Clinical Outcomes and System Outcomes used quantitative data from relatively large samples to measure standardised outcomes and for controlled comparisons. Theme Leads for these three themes developed a cooperative and collaborative relationship with SA Health Data & Reporting Services that facilitated access to routinely collected, clinical, system and population health data.

The *Patient Centred Experience* and *Staff Engagement* Themes generated new qualitative data (narratives from patients, carers and staff) to add depth, detail and nuance to quantitative findings, through examining issues that individuals encountered (Quinn Paton 2002).

Following identification of the five key themes, the Program Logic was used to map out tasks and a timeline to guide the Case Study (**Appendix 10.2)**.

Overall, the approach to the Case Study was scholarly and fit for purpose, with ongoing peer review both within and across themes contributing to the rigour of the research.

Figure 3. The Case Study Approach

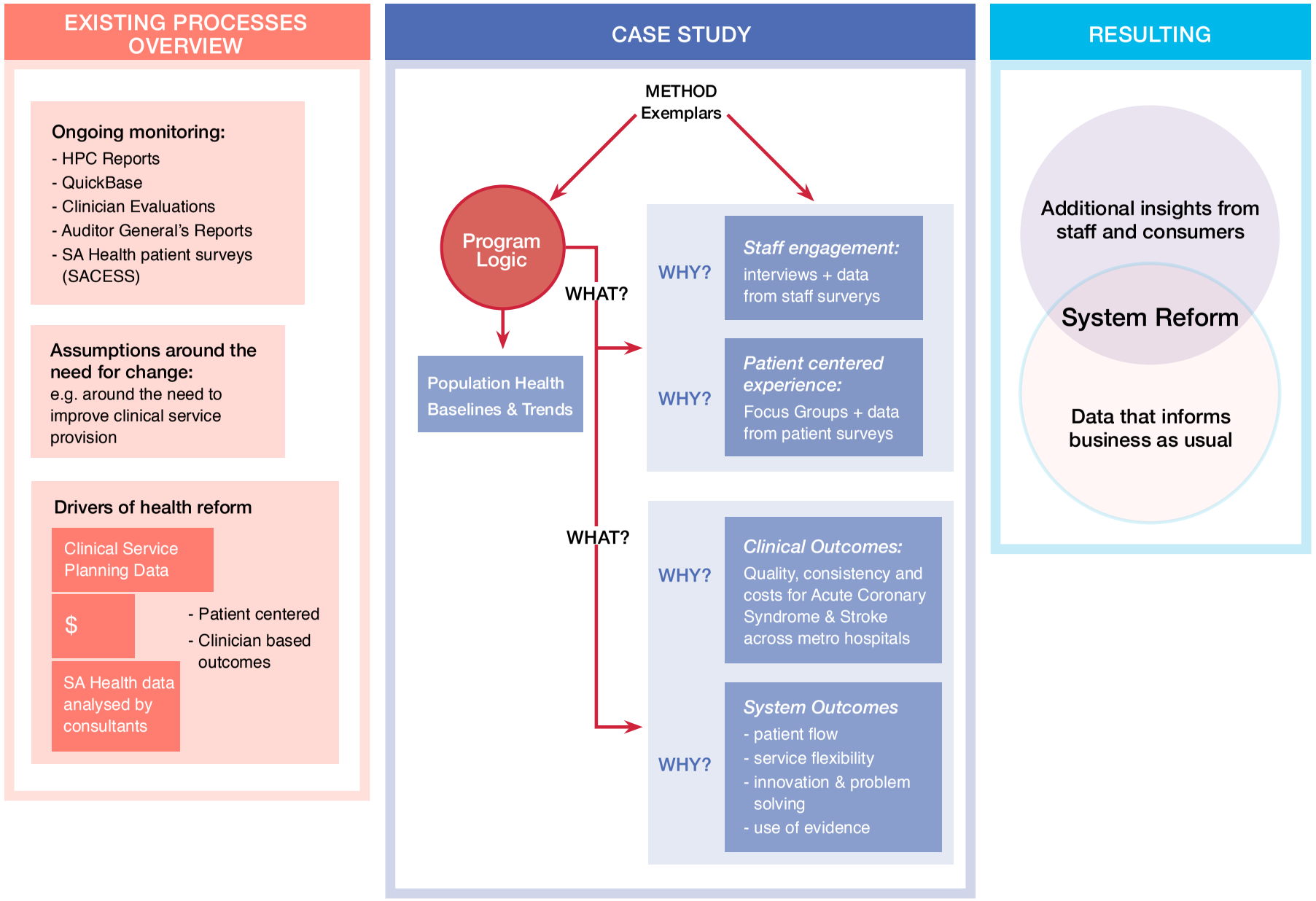


Table 3. The Program Logic for the Case Study showing Transforming Health Evaluation Pathways.

Business Case	Strategic Inputs	Activities	Outputs	Short & Medium-term Outcomes	Long-term Outcomes
Triple aim • Patient-centred • Better health • Better value **Issues** • Too many transfers • Insufficient training • Staff retention • Long wait for discharge • High level cancelations for elective surgery • Unavailable senior clinicians • Unable to meet standards & health roundtable • Too many mortalities • Too many procedures • Financially unsustainable	Consumers, carers, patients & family Health service organisations & stakeholders SA Health Staff – DHA & LHNs South Australian community 284 Clinical Standards of care & 6 Quality Principles Clinical leadership International & National benchmarks: – Safety & quality – Financial expenditure – Clinical variation – Population health needs Electronic patient administration system (EPAS) Financial investment & capital works	**Consumer and Stakeholder Engagement** **Workforce development, capacity & allocation** **Teaching, Training and Research** **Internal and External Communications** **Statewide Models of Care** **Metro Hospital activity reconfiguration** **Metro Hospital redevelopment & upgrades** **Integrated data systems** **Operational system improvements** **Governance frameworks**	**Patients and Families actively involved in care** **Staff Engagement** • Health system mindset & behaviour change • staff movements & retraining • Statewide leadership program **Clinical Pathways** • Stroke • Rehabilitation Services • Acute Coronary Syndrome • Orthogeriatrics acute management hip fractures **Service Movements and Activity Reconfiguration** • Intra-LHN activity transfers • Inter-LHN activity transfers • Demand management strategies • Effective surgery improvement strategy • Improved mental health services • 7 day access to allied health services • Operational policy work to improve patient flow • 24/7 access to diagnostics & imaging at required sites **System Change** • Leadership • Governance networks & Strategies • Policies and policy frameworks	**Improved Patient Experience** Patient-centred, safe, accessible, efficient, timely, effective & equitable provision of Adelaide public hospital care **Staff Engagement** A workforce that is fit for purpose, agile, motivated and mobile Leadership behaviour that enhances opportunity for cross-units and inter-disciplinary collaboration **Clinical Improvement** • Standardised hospital mortality rates • Standardised hospital length of stay • Standardised hospital capacity • Improved efficiency • Less safety incidents **System Improvement** • Patient flow through the system • Variation in the system • Evidence based practice • Use of innovation	**I. Improved Population Health Outcomes** Getting better health outcomes for all patients including Closing the Gap for Aboriginal health outcomes **II. Meeting National Standards** • Meeting clinical standards of care • Meeting International and National Benchmarks • National alignment for procedure numbers **III. Improved Staff Engagement** • Strong partnership between government and university sectors in relation to workforce planning and development, training, knowledge generation and implementation • Innovation and inquiry are embedded in workplace culture fostering continuous quality improvement **IV. Financially sustainable healthcare system** • Better value • Decreased cost to State budget

Assumptions: 1. Data is used to improved practice: people know how to access and implement/apply data to improve practice. 2. People have the power and authority to act based on information and timely communication. 3. There is team-based collaborative behaviour. 4. Metropolitan and country hospitals have interdependencies. 5. The hospital system has interdependencies with public health in terms of health promotion, protection and prevention. **Scope:** the TH Evaluation Working Group will prioritise and select key areas for evaluation in the first 12 months of operation. **Version:** 15 May 2017. This Program Logic for Transforming Health is based on Logic Model Development Guide, 2004, W.G. Kellogg Foundation, Michigan, US

Table 4. Summary of Themes, why they were chosen, and the data used.

Theme	Rationale	Quantitative data used	Qualitative data used	Model of Care investigated	LHN investigated
Population Health					
Theme aimed to identify baseline levels of health, time trends and disparities	To assist service planning and establish benchmarks for later evaluation.	-data on mortality, hospitalisation, from health-related registries and databases, -self-reported survey data for SA as a whole, priority sub-groups, and where relevant, health-service sectors (public and private)		N/A	N/A
The consumer/patient centred experience					
Investigated how patients perceive: • involvement & engagement in decision making & care • treatment with respect and dignity, information re their rights and providing feedback • experience of discharge from hospital	Staff and consumers are key stakeholders who need to be consulted about the status quo in investigating the need for reform. Their experiences can provide guidance on what is working well and areas for improvement.	Existing data from: The South Australian Consumer Experience Surveillance System (SACESS) Survey 2016.	New data from Focus Groups: One in CALHN with 7 Acute Coronary Syndrome patients Three in NALHN: with 11 Stroke/ Orthogeriatric / Rehabilitation patients	• Stroke • Rehabilitation Services • Acute Coronary Syndrome • Orthogeriatric-Acute Hip Fracture	CALHN NALHN
Staff Engagement					
Investigated staff perceptions of: • opportunities for personal growth and development • initiatives to increase leadership capabilities and resilience training • greater cross unit collaboration and the form that takes		Existing data from: Transforming Health Pulse Survey	New data from interviews: 13 with SA Health staff: 5 with clinicians who had lead roles with Transforming health 8 with Project Managers and other staff	• Stroke • Rehabilitation Services • Acute Coronary Syndrome • Orthogeriatric-Acute Hip Fracture	CALHN NALHN SALHN

Theme	Rationale	Quantitative data used	Qualitative data used	Model of Care investigated	LHN investigated
Clinical Outcomes					
Investigated whether new models of care Stroke, and Acute Coronary Syndrome (ACS) have: • resulted in improvements to patient-centred clinical outcomes and higher value health care • reduced unwarranted variation in the quality of care provided to patients across the State	Data re clinical and system outcomes can drive service reform and inform resources needed.	Existing data from: SA Health centralised systems for Stroke & ACS patients. Outcome variables include -mortality & hospital admissions within 30 & 90 days of presenting -average length of stay (LoS) -average costs -proportions of patients admitted after an ED presentation was analysed for ACS patients also.	N/A	• Stroke • Acute Coronary Syndrome	
System Outcomes					
Investigated outcomes for Transforming Health re: • the flow of patients through the system • the flexibility of delivery of services in the system to manage variation that occurs in the system		Used similar existing data to Clinical Outcomes Theme		• Stroke	CALHN NALHN SALHN
• enabling the system to use different types of evidence to deliver high quality patient care • promoting innovation/problem solving to improve system performance			New data from interviews with four clinical lead volunteers, from each of the four models of care in the Case Study	• Rehabilitation Services • Stroke • Acute Coronary Syndrome • Orthogeriatric-Acute Hip Fracture	CALHN NALHN SALHN

3.2 What was included in the Case Study

- Investigations were limited to changes in the four Clinical Projects that had been implemented for a sufficient length of time to have generated measurable outcomes before the end of 2017. The projects investigated and the LHNs covered in each theme investigation are summarised in the last two columns of **Table 4**.
- Members of the Working Group consulted with members of the Aboriginal Expert Advisory Group (AEAG) regarding what worked and did not work for Aboriginal people in Transforming Health.

3.3 What was not included in this Case Study

- Long term outcomes were not evaluated within the limited time frame of the evaluation.
- Outcomes for different population groups such as Aboriginal people, or culturally and linguistically diverse people were not evaluated. Time and budget constraints limited the investigations that could be conducted with specific population groups.
- Outcomes for all activities and models of care implemented under Transforming Health across all LHNs. We were limited to investigating activities that generated outcomes within the Case Study timeframe, and the LHNs in which they had been implemented.
- Outcomes for Country Health SA Local Health Network (CHSALHN), the Primary Health Care Sector, Women's and Children's Health Network. These were not within the scope of the Case Study as Transforming Health concluded before changes that had been implemented in metropolitan LHNs could be extended to other regions.
- Impacts were not evaluated of the following moves to support hospital profiles:
  - Between Lyell McEwin and Modbury Hospitals
  - From The Queen Elizabeth Hospital and Royal Adelaide Hospital to Lyell McEwin Hospital
  - Decommissioning of Repatriation General Hospital
  - Flinders Medical Centre/Noarlunga Hospital
  - The Queen Elizabeth Hospital/Royal Adelaide Hospital
  - Decommissioning of Hampstead Rehabilitation Centre
  - The move to the new Royal Adelaide Hospital in September 2017. This may have had the effect on introducing another variable in the data around clinical and system outcomes and staff engagement.

Using the Program Logic, the Working Group focused its attention upon the four specific Clinical Projects and worked collaboratively with SA Health staff for access to data, consulted with Project Managers and clinicians at all levels, and consulted with consumers for feedback on the patient and carer experience.

4. What we found: summary of theme investigations and results

This section provides a brief overview firstly, of the investigations into the engagement of Aboriginal people with Transforming Health and secondly, of the five themes.

This will set the scene for synthesising these results into a discussion to provide insight into what the health system change has meant for stakeholders at all levels.

Full reports of all Themes are given in the Appendices in **Section 10.3**.

Although investigations were focused on the four specific projects, it was not always possible to limit discussions with consumers and staff to these models of care and there may be overlap with other services provided.

4.1 What did and did not work for Aboriginal people in Transforming Health

The fact that the AEAG was not formed until 2016 had an impact on what it could achieve, as much of the planning for health reform had already occurred. AEAG members cited a lack of clear direction regarding the form and function of the AEAG, particularly its role in ensuring that the needs of Aboriginal people were addressed by Transforming Health.

AEAG members also expressed the following concerns:

- Despite the fact that Aboriginal people are only 2.5% of the South Australian population, they make up a large proportion of healthcare consumers. Yet, when SA Health conducted sessions to obtain feedback from stakeholders, there was little to no information in the 'gallery walks' that related to Aboriginal people.
- AEAG members perceived that the strong recommendations made during sessions on models of care, especially those having particular relevance to Aboriginal health, such as cardiac and renal models of care, were not given due consideration.
- There was some confusion as to which activities were being implemented under Transforming Health and which activities were parts of 'business as usual'. This is especially pertinent as the scope of Transforming Health did not include Country Health SA Local Health Network, even though activities were having a significant impact on Aboriginal consumers in country South Australia.
- The AEAG perceived that, for most parts, the development of Aboriginal Health Impact Statements for each model of care was an apathetic attempt to take into account Aboriginal people and their health needs. The majority of Aboriginal Health Impact Statements did not achieve the desired outcomes as they were often completed at the end of the process taken to develop the models of care.
- The models of care are clinically centred and do not take in to account the psycho-social support needed for Aboriginal consumers before and after hospitalisation. This is an area requiring special consideration for groups with vulnerabilities, particularly those who do not or cannot access the necessary supports.

The lessons that can be learnt from this experience include:

- Any future planning to address the needs of Aboriginal people must have strategies which detail clearly the translative actions required for all Local Health Networks.
- The existing SA Health Aboriginal Health Impact Statement Policy Directive aims to ensure that Aboriginal stakeholders have been engaged in the decisions that affect their health and wellbeing. Culturally respectful engagement will ensure that proposals optimally address Aboriginal health disparities. As this Policy Directive is mandatory, consultation and engagement must occur to ensure that impact considerations are included as a part of any future service design or redesign.
- More work is required across SA Health to ensure that the necessary steps are taken to attract new Aboriginal employees into the organisation, retain and develop existing Aboriginal employees and to plan for a future workforce that is responsive and reflective of the needs of Aboriginal South Australians.
- Consideration needs to be given to providing psycho-social supports for Aboriginal consumers before, during and after hospitalisation.

Finally, it is the view of the AEAG that engaging Aboriginal people, families and communities in all aspects of service delivery, from individual care through to service planning and policy development is important to ensure services are culturally safe and meet the needs of Aboriginal consumers. Health outcomes will only improve when barriers to accessing health services are addressed and Aboriginal people have a clear voice in how services are delivered.

4.2 Population Health

The aim of the Population Health Theme was to identify baseline levels of health, time trends and disparities within SA, to assist service planning and establish benchmarks for later evaluation.

Method

Baselines and trends presented were derived from analyses of mortality, hospitalisation, health-related registries and databases, and self-reported survey data for SA as a whole, priority sub-groups, and where relevant, health-service sectors (public and private).

Results

Results (see summary in **Table 5**) showed that SA generally has very similar outcomes to Australia as a whole for life expectancies at birth, mortality and hospitalisation rates, pregnancy outcomes, and cancer survival.

SA has experienced equivalent reductions over time in age-standardised death rates from all causes of death combined. There are disparities within SA by remoteness of residence, socio-economic status, and Aboriginal status.

Each disparity warrants individual interpretation and decision-making as to likely causes and amenability to remedial action.

Results for self-reported health status and risk factors are not included, but they indicated that actions in primary prevention are needed to address:

- lack of exercise and raised BMI (especially in the metropolitan area)
- inadequate fruit intake, in outer regional and more remote areas in particular
- elevated tobacco smoking rates
- excesses in single-episode alcohol consumption.

-Conclusions

Too little follow-up time has elapsed since the introduction of the Transforming Health initiative in early 2015 to use these statistics to identify subsequent change, but these data do provide benchmarks that will be useful comparators in later evaluations.

The same data sources should be used to facilitate these comparisons, although more focused development of additional metrics may be taken for health areas that are selected for special attention.

In general, further and more detailed analyses are required to determine causes and facilitate service targeting.

Table 5. Summary of baseline Population Health data pre Transforming Health

	Mortality (age-standardized death rate)	Age-standardized hospitalisation rate	Pregnancy outcomes & childhood immunization	Cancer screening, vaccination and survival:
SA overall	Life expectancy at birth in SA equates with national figures of 80 years (males)/85 years (females) Overall age-standardized death rates (2003-2015) are similar.	A slightly lower (5% lower) hospitalization rate for SA than Australia overall (public & private)	Perinatal death rate per 1,000 live births: 8.9 for SA in 2014, vs. 9.6 nationally. SA and national rates similar for: -low birth weight, -low Apgar scores, -infant mortality. -Caesarean section Smoking prevalence first antenatal visit: 13% for SA vs. 11% nationally	-Breast, cervical and bowel screening coverage tend to be higher for SA than Australia overall (2014-2015 data) -3-dose HPV vaccination of females turning 15 years of age in 2014 was equivalent for SA and Australia
Aboriginal residents	40 % higher than non-Aboriginal residents Unadjusted for correlates (i.e. remoteness, SES, etc). Further analysis and consultation required with Aboriginal stakeholders	151% higher than non-Aboriginal residents Unadjusted for correlates (i.e. remoteness, SES, etc). Further analysis and consultation required with Aboriginal stakeholders	For births to Aboriginal vs. non-Aboriginal mothers: -74% higher perinatal death rate -higher frequencies of low birth weights and low Apgar scores -Aboriginal mothers almost four-times tobacco smoking prevalence of other mothers at time of first antenatal visit	For all cancers combined (excluding non-melanoma) a substantially higher survival since 2000-2004 for non-Aboriginal than Aboriginal people with cancer.
Remoteness	12% higher for outer regional 8% higher for more remote areas	10% lower for inner regional and 16% lower for remote & very remote areas,	Mothers from very remote areas: -higher frequency of low birth weights -higher caesarean section rates -higher tobacco smoking prevalence	
SES of residence	Lowest SES quintile has a 34% higher age-standardized death rate than the highest SES quintile.	10% higher for lowest SES quintile than highest SES quintile.	Births to mothers from lower socioeconomic areas have a: -higher frequency of low birth weight -less likely to be delivered by caesarean section -mothers have a higher tobacco smoking prevalence	Higher survival of patients from higher SES residential areas (measured in quintiles)
Local Health Network	SALHN – lowest CALHN – 7% higher Country Health SA LHN – 13% higher NALHN – 20% higher	-similar rates for NALHN, CALHN, Country Health SA LHN -about 10% higher for SALHN		
Primary Health Network	5% higher for Country SA PHN than Adelaide PHN			

4.3 The Patient Centred Experience

This Theme investigated whether the experience of patients receiving healthcare through Transforming Health was one that was patient centred.

Method

Quantitative data about the patient centred experience in 2016 were accessed from the SACESS Survey (Grant et al., 2017).

Qualitative data was generated from Focus Groups conducted with patients and carers experiencing care under the models of care for Acute Coronary Syndrome, Stroke, Orthogeriatric – Acute Hip Fracture Management, and/or Rehabilitation Services. Patients and carers discussed the following questions:

- On reflection, how do patients perceive they have been involved in decision making and engaged in their care?
- To what extent have patients been treated with respect and dignity, and been informed about patient rights and ways to provide feedback?
- What are patients' perceptions of their experience upon discharge from hospital?

Transcripts of Focus Groups were analysed to determine which aspects of care were most important to the patients and carers. Categories of patient centred care have been defined in a framework for patient centred care (Kitson, Marshall, Bassett, & Zeitz, 2013). This framework was used to categorise positive and negative responses from the Focus Groups, and the frequencies of these responses were determined.

Results

Figure 4 shows that there was essentially an even divide between negative (52%) and positive (48%) responses. Positive responses were indicative of things that were done well and negative responses suggested areas for improvement in the models of care investigated.

Things that were done well included:

- Positive Therapeutic Environment:
  - patient satisfaction with the meals provided
  - friendly and supportive staff providing expert care
  - the Rehabilitation Services model of care at Modbury Hospital, where staff worked within a supportive organisational system to communicate knowledge and information effectively, and cooperated as a team to customise individual programs for patients according to their needs.
- Information, Communication and Education:
  - Patients and carers were appreciative of good communication between staff such as physiotherapists and occupational therapists that helped to coordinate clinical care.

Areas for improvement related to:

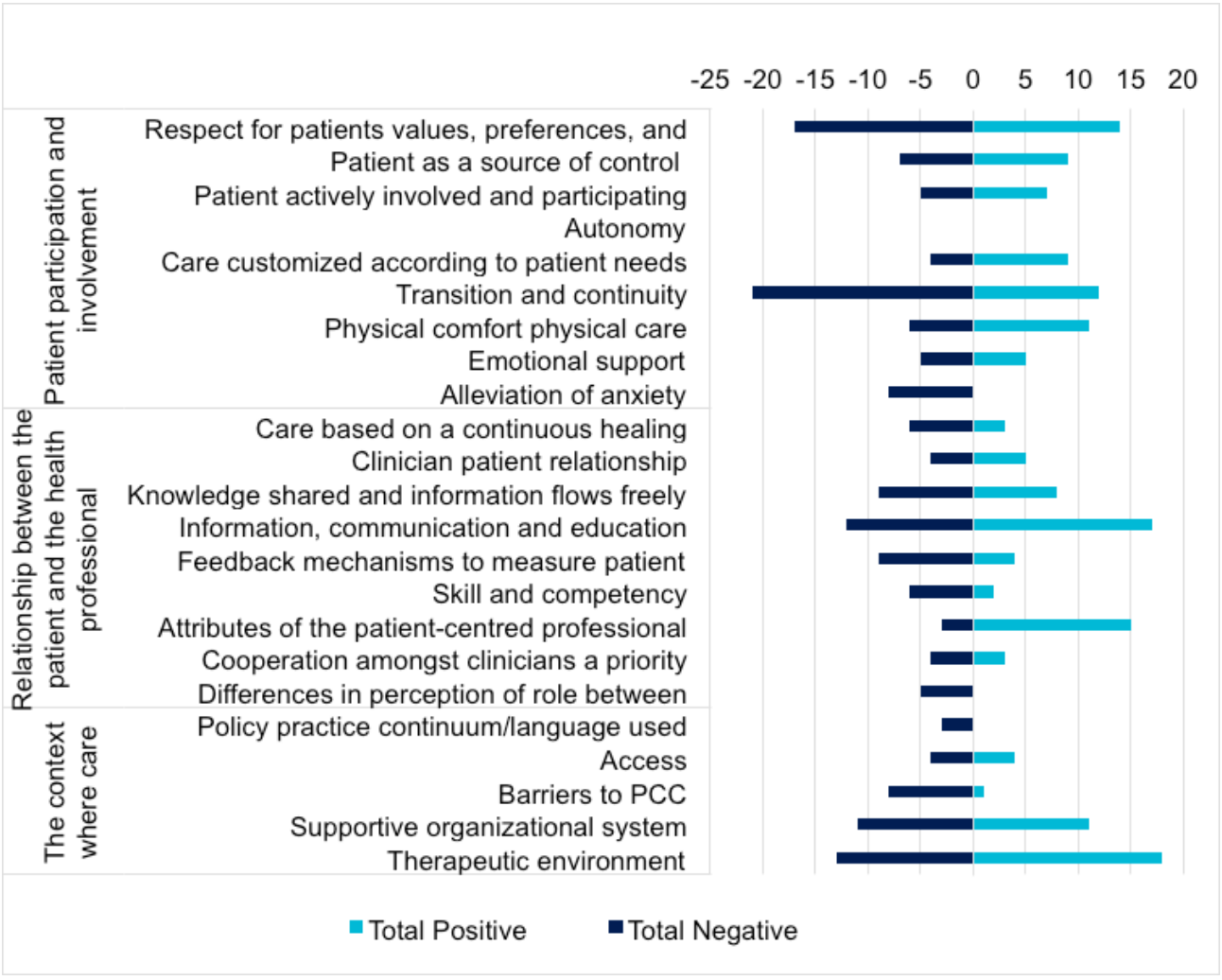
- Transition and Continuity of Care: patients expressed concerns about:
  - not being given sufficient notice to prepare for transfer to another hospital
  - lack of continuity of care due to patient details not being transferred
  - delays to commencing rehabilitation if they were transferred at the end of the week.

- Respect for Patients' Expressed Needs:
  - Some patients perceived a lack of respect when the preferences and needs were not listened to by staff, who then made decisions (e.g. about discharge) that were difficult to understand, especially when no explanation was provided.
- Information, Communication and Education:
  - There was lack of information for consumers on their rights and how to provide feedback.

Information from the Focus Groups was in general agreement with results from the SACESS Survey, except with regard to "Respect for Patients' Expressed Needs." This indicator for the Survey scored well above the State benchmark whereas there were high numbers of both positive and negative responses from Focus Group participants in this area.

The patient experiences reported here can only be associated with the four models of care investigated rather than attributed to them, as there would have been many other factors contributing to patient care at the time.

Figure 4. Positive & Negative Reponses by Themes & Categories of the Kitson Framework for Patient Centred Care (PCC)



Conclusions: While patients could be treated under the same model of care and in the same therapeutic environment, they could have very different care experiences sometimes very positive and sometimes very negative. This suggests there is opportunity to explore and improve consistency of care processes within models of care and particularly in the areas of:

- transfer between hospitals
- discharge from hospital
- open communication between staff and patients/carers so that knowledge and information flows freely
- the process of informing patients and carers of their rights and ways to provide feedback.

The methods used here to collect feedback from consumers have generated a richness of data to inform lessons that can be learned, and could provide a useful platform to inform strategies for future evaluation in patient centred health care.

4.4 Staff Engagement

The Staff Engagement Theme explored whether Transforming Health provided opportunities for staff for professional growth, and specifically to develop leadership skills, resilience to change, and ability to collaborate across units.

Methods

A total of 13 interviews were conducted between September 2017 and January 2018. Five interviewees were clinicians who had lead roles with Transforming Health and others were staff with roles such as Project Manager. Six interviewees were female. Common concepts emerging from the interview data are set out below.

Mark Moore's Strategic Triangle approach (Moore, 1995) was used as a theoretical framework to illustrate some of the themes that emerged from the interviews. The framework presents three interrelated areas in public sector organisations which need to be addressed if staff in organisations can perform to their optimum level. These include having the organisation's purpose clearly articulated and actioned consistently (called the public value proposition); having the necessary skills and attributes and resources to do what is required to change (organisational capacity to do the job); and ensuring that accountability, governance structures and processes are fit for purpose (termed the authorising environment).

Results

Staff interviewed referred more to the underlying values driving Transforming Health and the need to have these consistent and explicit; the importance of preparing staff in leadership and project management roles with the necessary skills and resources to do the job; and ensuring there are appropriate governance processes in place. Greatest concern was around the sustainability of the changes due to lack of shared values or common purpose; lack of consistent support of front line staff and lack of transparency around the governance processes.

Value Propositions

Things that were done well:

- Staff anticipated the potential opportunities that Transforming Health could offer to move out of silos, pre-plan how to engage with clinicians and develop an effective strategic direction.
- Staff reported positively about the increased sense of engagement and collaboration across the system. Nursing, medical, physiotherapy, social worker, Aged Care Assesment Team (ACAT) and rehabilitation staff worked together on models of care that had the patient as the focus, leading to integration across disciplines working together.

Areas for improvement:

- Staff perceived a lack of transparency in consultation e.g. the business case for Transforming Health was not released or made available to Project Managers and limited data was available on performance of the health system.
- Some staff had negative comments about the communication around clinician engagement, perceiving that it actually undermined any effective engagement and that the overall investment in communication about Transforming Health bordered on 'propaganda'. They considered that the forums held previously through the Clinical Networks could have been just as effective for clinician engagement.
- There were concerns about the sustainability of improved collaboration, that in the context of Transforming Health coming to an end, there would be a return to the previous, less effective way of operating.

Capacity to do the job

Things that were done well:

- Staff valued the opportunity to develop their leadership skills on the job through the range of training and development that was offered as part of capacity building for staff involved in Transforming Health. For example, they found that the Leadership Program provided:
  - a framework around leadership
  - an opportunity to reflect on which of those traits they already had, and also areas to be more aware of
  - an opportunity to relate to people outside their usual work environment.
- Staff commented positively on how productive engagement and the timely success of projects were due to combining the expertise of the Project Manager with leadership of the clinician heading up the project. They also valued how medical and nursing staff worked together as project leads in hospitals.

Areas for improvement:

- Project Managers perceived a lack of support, a lack of opportunity to network across LHNs or to attend professional development training (e.g. Leadership Program) and to feel respected in the role.
- Location of the Project Managers, in that they were not co-located with their clinical leads for the duration of Transforming Health, appears to have impacted on their ability for engaging with each other and maximising their potential to local hospital politics in ensuring effective staff engagement.
- The importance of the LHN communication plans with staff, that each of the LHNs was responsible for developing, seems to have been undervalued.
- Staff commented that their ability to do their jobs was affected by the move away from Clinical Networks. They felt that the interdisciplinary collaboration involving metropolitan clinicians and country providers within the Clinical Networks was lost when the Clinical Networks, Clinical Senate and the Surgical Services Taskforce, which was highly valued for the leadership it provided, were replaced by clinical groups formed to focus on metropolitan settings and with a specific project scope.

Authorising environment

Things that were done well:

- Some staff perceived that Transforming Health provided legitimacy and an authorising environment that had previously been absent. People were being brought together in multidisciplinary teams that were able to link in the specialists and get everyone doing the same thing at the same time.
- The approach from MCAG, of broad engagement at the commencement of clinical projects through a workshop format, was seen as an extra benefit that the Clinical Networks had not used, which allowed broader consultation and engagement. The workshop approach was described as non-traditional and forced collaboration and enable facilitators to ask questions of participants. This was then complimented by an approach that engaged disciplines in the pilot projects. Nursing, midwifery, allied health and medical staff worked along side each other.
- Staff perceived that a lot of collaboration occurred between different stakeholder groups, consumers, clinicians, finance and others, to come up with agreed state wide models of care. Although there have been different challenges along the way, implementation seems to be going in the right direction under this process.

Areas for improvement:

Staff ability to do their jobs was affected by the move away from clinical networks. The resilience of the project managers and the leadership of specific clinicians often helped in these situations.

Staff emphasised the importance of accountability and the need for effective governance to be supported by the right mechanisms to hold people at all levels to account, if the changes in behaviour needed to implement Transforming Health were to be achieved.

One clinician noted the importance of this process contributing to capacity building and the value of handing over the leadership and implementation to more junior consultants. The need for ongoing support was raised by others in relation to sustainability of the changes and the processes in place.

Conclusions

Limited conclusions can be made on the impact of Transforming Health on staff engagement. The Transforming Health agenda seemed to have provided legitimacy and an authorising environment that had previously been absent. Improved collaboration was evident with people were being brought together in multidisciplinary teams that were able to link in the specialists and get everyone doing the same thing at the same time.

An ongoing concern is whether initiatives are sustainable beyond the urgency and mandate created by Transforming Health, and the Project Managers often provided useful insights into how future governance structures and resourcing could facilitate broader cross disciplinary, cross specialty or cross-LHN collaboration.

There is clearly a strong affiliation among staff in the LHNs to their LHN and this largely overrides any sense of belonging to SA Health as a state-wide entity. This warrants further exploration and specific recommendations to understand the barriers and enablers to staff engagement at a deeper level.

4.5 Clinical Outcomes

This Theme evaluated the extent to which Transforming Health delivered consistently high quality health care across all metropolitan hospitals, providing better value and decreased costs to State budget. It investigated the following questions in the selected clinical areas:

- Have the new clinical models of care resulted in improvements to patient-centred clinical outcomes and higher value health care?
- Have the new clinical models of care reduced unwarranted variation in the quality of care provided to patients across the State?

Methods

The Stroke Model of Care and Acute Coronary Syndrome (ACS) Emergency Department Pathway were selected as case studies because these were the clinical areas in which the new models were implemented earliest, and for which data can be analysed to estimate the early effects of the new models of care.

Data were extracted from centralised data systems held by SA Health for patients presenting at a South Australian metropolitan public hospital from January 2015 to June 2017, who met defined eligibility criteria for the two clinical areas. Outcome variables included mortality and hospital admissions within 30 and 90 days of an index presentations, average length of stay (LoS) and average costs.

A relatively new method, Covariate Balancing Propensity Scores (Imai & Ratkovic, 2014), was used to adjust for differences in baseline characteristics between patients presenting at different hospitals and at different time points. The analyses adjusted for differences in age, sex, socio-economic status, Indigenous status, after-hours presentation and a range of comorbidities.

Results

- For ACS presentations:
  - Statistically significant reductions in mortality at 30 days and 90 days were observed in the first quarter of 2017 compared to 2015, building on non-statistically significant improvements in 2016.
  - There were no other statistically significant differences in the other outcomes, though average length of stay decreased slightly in 2017.
- For Stroke:
  - non-statistically significant increases in mortality and readmissions were observed in 2016
  - These outcomes returned to levels similar to 2015 in the first quarter of 2017.
  - Length of stay showed a downward trend, building to a statistically significant reduction by 2017.
  - Separation costs remained similar across all three time periods.
  - There was some indication of reduced variation in outcomes between hospitals over time, though the numbers of stroke patients presenting at individual hospitals provided little power to detect real differences.

Conclusions

The reported results capture the early effects of the new models of care implemented as a result of the Transforming Health initiative, and indicate movement of clinical outcomes in the desired direction. Regular updates of the reported analyses, across a wide range of clinical areas will better represent the effects of Transforming Health and inform further, continuing improvements in the South Australian health system.

4.6 System Outcomes

This Theme investigated whether Transforming Health provided an opportunity for system change across metropolitan hospitals through improving the flow of patients through the system, and the flexibility of delivery of services to manage system variation.

It also investigated whether Transforming Health promoted innovation to improve system performance and enabled the system to use different types of evidence to deliver high quality patient care.

Methods

Patient Flow and System Variation

Quantitative methods were used to explore patient flow and the flexibility of delivery of services to manage system variation. Variation in observations in health care is to be expected, as unlike a production process environment where only uniform products are being made, health is dealing with patients. Patients vary and therefore the care they receive will also vary.

Shewart's control chart (Shewart, 1931) enables the variation of the process to be monitored and assessed over time, with performance that is considered unusual to be separated from performance that is considered within the normal bounds of operation. This tool was therefore used for the examination of the variation of flow of patients through the system, as shown by the average length of stay, in relation to Transforming Health. However, this tool did not enable investigation of Question 2, regarding the flexibility of delivery of services to manage variation that occurs in the system.

Average length of stay data, relating to the treatment of Stroke and Acute Coronary Syndrome patients, were obtained from SA Health. Descriptive analysis of the data was undertaken and control charts were constructed for stroke patients discharged home and who suffered a stroke as coded by Diagnostic Related Group B70B (stroke and other cerebral disease + severe complications) and ICD-10 classification of cerebral infarction (I63).

Innovation and Evidence-base

The promotion of innovation and the use of evidence were investigated using qualitative methods, specifically interviews with six clinical leads. All models of care were represented through the interviews and CALHN, NALHN and SALHN were represented in the sample.

The interview transcripts were analysed using QSR Nvivo11 qualitative data analysis software. Analysis was based on the manifest content, the visible and obvious components of the qualitative interview (Graneheim and Lundman, 2004). An interpretive paradigm was used to understand the qualitative interviews, meaning that analysis focused on learning about what was meaningful and relevant to the clinical leads (Neuman, 1997).

Results

Patient Flow and System Variation

It was evident that variation in process – based on patient stay – existed, that changes in the "system" occurred and changes at individual sites occurred. The processes at individual sites are different – based on the length of stay (see Section 10.3.5, Figure 4) and further evidenced by the use of different wards (see Section 10.3.5, Table 4 e.g., rehabilitation at Hospital C).

Almost all variation was within normal expectations: only two events that fell outside the normal expectation were observed. The bound of variation for the processes (as a system and at individual sites) improved, i.e. there is evidence that patient flow improved.

While changes in the process of care can be observed and the approximate timing of the change of process identified, it is not possible, on the basis of the analysis of the data alone, to attribute the cause for the change to activities relating to Transforming Health. To do this would require significant additional investigation that is beyond the scope of this exercise.

In pursuing the implementation of significant change, it is important to recognise that variability can and should be modelled. Indeed, simulation tools now exist that enable the detailed modelling of health services, significantly reducing the risk associated with such change and enabling the testing of a greater range of solutions. To embark on any significant change without such modelling means that variation cannot have been reasonably accounted for and nor can a range of possibilities.

In the qualitative evaluation only one clinical lead reported relying on modeling undertaken centrally, and no clinical leads reported using modelling or simulation to improve patient outcomes as part of Transforming Health. Given these insights combined with the evidence-base supporting the added value of simulation and modelling, it is a missed opportunity that Transforming Health was not predicated upon sophisticated simulation.

Innovation and Evidence-base

Innovation as part of Transforming Health was seen to be new, more efficient, consistent clinical pathways across the system by clinical leads who reported that several clinical innovations were implemented as part of Transforming Health and some clinical innovations occurred prior to Transforming Health.

Data, health information and evidence-based practice were inter-related. All clinical leads were concerned about data access and the use of data and health information to improve health practice and outcomes. Staff from one model of care reported having good data and health information for monitoring their practice as a result of Transforming Health and other staff anticipate continued progress toward improved data access and health information.

Rivalry between sites was evident especially in relation to the level of infrastructure and resources distributed through the implementation of Transforming Health. All sites interviewed mentioned the value of professorial positions between the hospital and South Australian universities to promote innovation and evidence-based practice.

Conclusions

Process control charts were used to explore variation in the system and to examine if patient flow, as shown by the average length of stay, had improved. The findings confirmed that variation in process existed and that changes in the system and at individual sites occurred. Attribution of the changes to Transforming Health, however, was not possible.

In view of insights from the qualitative evaluation, where little or no modelling or simulation was used to improve patient outcomes as part of Transforming Health, it would seem a missed opportunity that Transforming Health was not predicated upon sophisticated simulation.

The following practices, not all of which were addressed through the Transforming Health change program, were identified as being important for the success of innovation and evidence-based practice in Transforming Health: a combination of local governance and decision-making; supportive organisational culture; attending to the history and context of particular sites; improved access to data and health information; and time to support the substantial Transforming Health change program.

Limitations to the System Outcomes evaluation included the short timelines, delays with ethics approvals, focus on only one model of care in the quantitative component and small sample size in the qualitative component (n=6). The findings from this study are in no way representative, should not be generalised and should be treated with caution.

5. Bringing the results together

The 'Transforming Health' agenda conducted by SA Health across its metropolitan hospitals is an example of 'large-system transformation in health care'. Large-system transformation in health care is defined as 'interventions aimed at coordinated, system-wide change affecting multiple organisations and care providers, with the goal of significant improvements in the efficiency of health care delivery, the quality of patient care and population level outcomes' (Best et al 2012, page 422). It is important to note that the Transforming Health initiative was established without the explicit use of a theoretical framework or model to guide or explain the change process. The state government recruited a number of consultancy companies to undertake discrete aspects of work, notably around establishing the case for change (McKinsey and Co); upskilling staff for the implementation of the change (Deloitte); and an independent audit of processes (Ernst & Young).

The aim of the evaluative Case Study was to describe which evaluated aspects of Transforming Health, within the four Clinical Projects investigated, worked, and why. This was part of the SA Centre's remit, as described by the Minister for Health "…to provide the evaluative lens, including a longitudinal study of the impact of Transforming Health" and to "undertake the ongoing evaluation of our transformative changes" (Minister for Health, 2015a, p. 12). Despite the stated commitment to undertake an evaluation, funding was not initially allocated to this activity nor was the evaluation plan generated prior to the planning and implementation of Transforming Health. These oversights created a number of challenges faced by the Evaluation Working Group.

Despite the case study limitations described earlier this Evaluation Report, the results and conclusions drawn are based on the data collected from the five different themes across four Clinical Projects and can be used to inform future implementation and evaluations across the South Australian health system. Importantly, all members of the Evaluation Working Group recognise the impossibility of being able to attribute the service changes and improvements described solely to Transforming Health.

Indeed, for those clinical areas and wider system activities which did demonstrate improvements over time (see Clinical Outcomes and System Outcomes, **Sections 4.5 & 4.6**), it could be argued that improvements were already happening in the system due to work undertaken by previous Clinical Networks (see System Outcomes **Section 4.6**) and hence cannot be attributed to the Transforming Health initiative. The purpose of the evaluation was not therefore to attribute causal relations; it was to try and explain why certain things worked and why others did not. This is why having data from multiple perspectives helps to explain what is actually happening in the system. The evaluation therefore has more similarity to a realist evaluation in that it considers what works, for whom, in what circumstances and why. Unlike realist evaluation, the Evaluation Working Group was not in a position to generate propositions against which to test reality with a view to generating mid-range theories that could be further tested. Hopefully, these stages to the refined evaluation approach can be embraced in future activity.

The following five main domains emerged as pivotal to taking the lessons learnt from the evaluative case study forward:

- **Data driven and informed service improvements**
- **Governance arrangements (that promote independence, collaboration and local accountability)**
- **Effective communication (of the need for change and ongoing feedback)**
- **Effective engagement (better stakeholder strategies)**
- **Clinical engagement /effective involvement of clinical leaders, clinicians and support staff from all disciplines**

Each of these domains will now be discussed. Tables provide the following information relevant to each domain: findings synthesised from the evaluation, quotes from staff, patients and carers who participated in the evaluation, and recommendations for future priority setting activities.

Domain 1: Data driven and informed service improvements

The work led by David Roder around the Population Health Theme has generated a composite set of baseline population health data for the first time for South Australia. These baseline data were derived from analyses of mortality, hospitalisation, health related registries and databases and self-reported survey data for SA as a whole, priority sub-groups, and where relevant health-service sectors (both public and private). Taking the 2015 data set, which is pre Transforming Health, we now have a baseline against which to monitor interventions which we wish to improve. The data present a very detailed picture of the health and wellbeing of South Australians, as well as identifying variations in hospital admission rates by LHN, and individual characteristics.

Of note from the data are disparities within SA by remoteness of residence, socio-economic status and Aboriginal status. Each disparity warrants individual interpretation and action around the likely causes and proposed interventions. The data therefore, in the overall context of a post Transforming Health era, can provide a 'road-map' to shape and inform priority setting activities and health investment strategies.

Clinical leads and Project Managers referred to the importance of having real time access to clinical data. Through the development of the new models of care, new data analytic systems (**Section 2.5**) were developed and these were greatly appreciated by clinical staff. Several comments were made about the importance of being able to monitor one's own activity as well as compare trends across the whole system. Another important attribute of the data sharing was greater transparency around the financial cost of services. SA Health worked very closely with Theme Leads from the Evaluation Working Group to co-design better ways of harvesting, cleaning and presenting data, and this is an initiative that has been highly valued.

There seemed to be less consensus or clarity about how routinely collected data around patient experiences and/or individual staff experiences of change were managed. Data from the SACESS survey (Grant et al 2016) around patient experiences did not reflect the detailed feedback from the patient/carer Focus Groups. Of note from the data from the Focus Groups was the divide between negative and positive patient responses – perhaps indicating that interviews and Focus Group methodology is a much more sensitive and authentic way of getting feedback on experiences. The range of areas for improvement is consistent with other data sources and ought to be considered in future priority setting activities.

One of the intents of the evaluation was to understand how staff experienced the changes introduced by Transforming Health. Again, due to timing and resource issues only a limited number of staff were interviewed but results did point to some common trends around the need for engagement, clarity of messaging and support and sustainability of any significant change program. These findings echo the wider evidence base on what makes large-system transformations successful in healthcare (Best et al., 2012). What would be important to consider for the future are simple ways to check whether the proposed implementation programs would be collecting data around these sorts of staff experiences.

Even though it may seem self-evident to state that one of the main findings from the evaluation was for the reform to be guided and informed by data, it is not the case. Significantly, the Evaluation Working Group worked to generate the population health data that would serve as a baseline for future longitudinal activity. Of note also was the very effective way in which SA Health and the clinical leads, together along with the Evaluation Working Group, worked on the emerging, real time, clinical data sets. This activity did transform conversations and ways staff had to understand and interpret what was happening in their systems. What were not resolved were the discussions around transparency of clinical data, and in particular comparative clinical and hospital data. We will come back to this issue under governance.

Table 6. Domain 1: Data driven and informed service improvements

Findings synthesised from the evaluation	Quote	Recommendation
Credible source	One of our biggest challenges when we first came into this was that no one actually knew whether or not we were doing a good job. No baseline…lots and lots of things being collected that often never saw the light of day (PM*)	Align population health data with LHN and local priorities
Accessible in real time for clinicians	We need to be generating high quality data and feeding it back to clinicians in real time (CL*)	Continue to invest in clinical data feedback systems that provide continuous synchronous feedback
Using data to inform strategic decisions	It's all very well to say the cost of your service is too high but unless you can provide that data and explain where the money flows in the system, it's unreasonable to expect people to really change their behaviour (CL*)	Ensure accurate clinical and cost effective data are available
Relevant and transparent	We're at the beginning stage now (of data monitoring and analysis) where we actually get together as a collective, to actually review what the results are…the quality driver as well depending upon the results that you get, if somebody else has got a better result than you, you can quiz them, what they are doing that's different to what you are doing… it's actually a mechanism to actually improve by comparing and benchmarking (CL*)	Consider governance processes which embrace transparency of data and ability to compare across sites
Relevant data from all stakeholder groups: patients and staff	And then the doctor came in and one who I had never seen before and they told me 'you're going out' I said 'How can I, I have no confidence in myself, there's nobody at home and I'm still wobbly. So how can you send me home? …I said 'How do you know? You've never seen me' He said, 'it's all here'. I had to go, but that is wrong I, I think it is wrong' (Patient*) …a healthcare system needs to grow, needs to change…it needs to evolve with the time, technology and new ways of doing things – and to remain exactly the same, well that's the situation we were in for 20 years. We didn't evolve. We didn't change how we did business…what we really needed was a re-evaluation of how we do our day-to-day business and this has given us a big kick start to that but we need to continue doing that and carry on…' (PM*)	Consider ways to integrate patient experiences with clinical data to understand the full picture Ensure all staff voices are heard in the system

*PM=Project Manager, CL=Clinical Lead. Quotes from *Staff Engagement* Theme
Patient quote from *Patient Centred Experience* Theme

Domain 2: Governance arrangements

A strong message from staff interviewed was the need to recognise the work that had been successfully undertaken through the Clinical Networks and to build on this when Transforming Health was announced. There was a view that many of the effective networks and cross boundary relationships that had been established through this process were jeopardised unnecessarily. This was particularly felt by the Project Managers, many of whom had been actively involved in earlier Clinical Network activity.

There was also a strong request for greater transparency around the original Transforming Health business case and data accessibility in general. While many thought the process of involvement in the standard setting exercise and subsequent development of models of care was good, there then seemed to be a lack of clarity or transparency around how MCAG worked and what authority it had to act. This has led to speculation about whether it is possible for a state health department to be both responsible for the operational activity of delivering a health service as well as lead a whole system redesign. It is noteworthy that in other jurisdictions (for example NSW and Victoria) the responsibility to lead health system redesign, innovation and reform is delegated to an independent entity. This in theory enables the organisation to construct its own narrative around the need for change, how it is going to go about it and how it will evaluate success. It also means that professional networks can be enabled to work effectively across local health boundaries.

Given the findings from staff which reinforced their view that it was difficult to think beyond the LHN, it would seem to be vital that new organisational models are considered which promote cross boundary, cross discipline collaboration, based on clear goals, transparent data and clear mechanisms which identify who is responsible for delivering what.

There was also a feeling that service reforms should be independent from 'business as usual' activity. Local Health Networks and communities of practice were seen as mechanisms that enhanced the movement of knowledge and innovations through systems, but there seemed to be a dissonance or disconnect between the way these processes were enacted and facilitated within existing SA Health governance processes, and how they could be enacted.

Timing of the setting up of certain governance groups was also problematic. Despite the credible start in terms of clinician involvement in the gallery walks and clinical advisory committees (see **Table 1**), there were unexplained delays in setting up the Transforming Health Consumer and Community Engagement Committee (TH CCEC established in July 2015), and the Aboriginal Expert Advisory Group (AEAG set up in August 2016). The experiences of the TH CCEC finished on a positive note, with the committee members commenting on the 'robust challenging and respectful relationships' that had been developed through the Committee, and that have flown on to increase consumer engagement in other areas of SA Health.

The experiences of the AEAG were, however, not so positive. After a late start, the advisory group felt their suggestions and recommendations were often ignored and mechanisms such as Aboriginal Impact Statements, which were completed for each model of care within Transforming Health, did not achieve the desired effect. A point raised by the AEAG was the lack of holistic care embedded in the new models of care. This was felt to impact Aboriginal people in particular, given the higher proportion of Aboriginal people using acute metropolitan services who were originally from remote and rural areas. Given that SA Country Health services were not considered 'in scope' for the first phase of the reforms, the consequences to certain user groups ought to have been more clearly articulated with contingency plans being drawn up in due course.

At the LHN level, the governance arrangements were also confusing. Staff interviewed talked about not knowing the processes to follow and that managing the change was like 'chasing a snowball down a hill, trying to catch up and the snowball kept moving'. This was problematic when clinical teams were required to adopt new models of care where many of them were unclear who had the authority to make decisions at the local level.

The overriding message from the evaluation was that the governance process needed to be more independent and transparent, with consumer and vulnerable user groups identified early on and integrated into the decision making and accountability processes from the start. Equally, a consistent message around accountability and governance arrangements was required at the implementation stage in LHNs.

Table 7. Domain 2: Governance Arrangements (that promote independance, collaboration and local accountability)

Findings synthesised from the evaluation	Quote	Recommendation
Build on what has worked	I think that the goal there would have been for Transforming Health to change the level of trust in the system, so that subsequent decisions will be made with a higher level of trust, and I think it's not done that. So, by removing the Clinical Networks, not measuring clinician engagement and not being transparent about it, by focusing overly on money and buildings, I think actually it has reduced the level of trust in the system, not increased it' (CL*)	Pay attention to building and sustaining trusting relationships to lead the system changes
Ensure transparency of decision making processes	The business case for Transforming Health should've been released warts and all right from the start…and I think by not doing that led to a lot of suspicion (PM-) I just think that probably a more open and transparent process, they might have done a better job at engaging staff and not having such an untrusting – I kind of feel like staff… didn't trust the whole process because there was no transparency or honesty from the beginning…(PM*)	Clarity around what is disclosed and how it is shared is required
Independence	Well I think it was a fantastic opportunity to change some of the old school thoughts about their, well, the silos and rearranging the system from these individual power bases that have just grown through history,…it's not to say they're not doing good things, but as the health system, you can't have every single site doing specialty service…but it'll be really good to get proper strategic direction and some pre-planning of how we engage with clinicians (PM*)	Consider other organisational models which separate the operational activity of health departments with organisations established to lead system innovations and improvements
Equitable engagement processes	When SA Health conducted sessions to obtain feedback about plans for Transforming Health from stakeholders (consumers, clinicians etc.), AEAG members perceived that there was little or no vision in the gallery walks for the 20% of vulnerable sub-groups.	Be clear what is in scope and what is out of scope and actively manage engagement processes

*PM=Project Manager, CL=Clinical Lead. Quotes from *Staff Engagement* Theme

Domains 3 and 4: Effective communication and engagement

The domains of Communication and Engagement are related so will be dealt with together. Findings from the Evaluative Case Study already indicate the lack of coherence around the (contested) use of data to present the case for change, and the lack of clarity around how the rationale for the change would be communicated across the system. Interactions which were judged to have worked well included the initial workshops to identify the standards; the setting up of the clinical advisory groups; the interdisciplinarity and cross LHN reach of the work streams and the work on the emerging models of care. There was general consensus from those interviewed that these steps in the process worked well.

However, where communication techniques were questioned were around the style of language used; the reluctance from the central leadership team of Transforming Health to embrace feedback and the lack of flexibility around adopting the central messages to local teams and contexts. Tolerating the continued activity within LHN silos was also seen as both a communication and engagement challenge as was the abrupt ending of the formal phase of the project. This left participants wondering about the value and worth of their investment and the potential sustainability of the efforts.

In terms of effective engagement of stakeholders, many of the comments around transparency and inclusivity, as well as equity and timeliness were reinforced under this theme. Transparency around the rationale for change as well as the business case were identified by staff as essential, as well as clear ways to empower those at local level to lead and implement projects and identify the scope of their decision making capabilities.

What did not work for stakeholders in terms of engagement from a staff perspective was lack of clarity around authorising decisions, and at times an over affiliation to their own LHN without due recognition or appreciation of the need to promote better models of care across all LHNs. For patients/consumers there was a sense that often clinicians did not take consumer feedback seriously. There was an interesting divide between positive and negative comments about consumer experiences of services, polarised between highly complimentary and positive statements to ongoing frustrations around transfers, discharges, open communication, and patients' and carers' rights.

Table 8. Domain 3 and 4: Effective Communication (of the need for change and ongoing feedback) and Engagement (better stakeholder strategies)

Findings synthesised from the evaluation	Quote	Recommendation
Things that worked: Standard setting workshops	'I think there was over 30 people at one of our sessions from all disciplines…everyone almost from all divisions, and for everyone to hear the patient journey from everyone's perspective was such a beneficial process, and then that sort of morphed into a model of care (CL*)	Build on the standard setting and models of care workshops to promote patent centred journey
Interdisciplinary working	In X the amount of collaboration across disciplines has increased dramatically I think…and that's despite a lot of people saying there's less – what I saw prior to going into this transforming health process were a lot of units that managed their own business individually and would not venture to another unit to work up a plan for something heading forward that – because it was just too hard going outside their unit but when TH started we were forced into a situation where medicine, surgery, critical care were all at the table together and able to vent concerns and frustrations, plan together for significant system change, which by its very nature has to be integrated with other areas (CL*)	Optimise interdisciplinary working on new models of care and implementation projects
Importance of celebrating success	We share our little wins that we've had – we now have that capacity and network to share amongst us – and use those lessons learned both in a formal and informal way that we didn't do before (CL*)	Actively celebrate achievements
Things that didn't work: The style of communication – 'hype'	I don't think anyone has any, or had any disagreement with first time quality and right place, right time and that. …but I think the data wasn't necessarily, I think it was a bit of pick and choose the data to show what they wanted, I think. It was quite pre-determined early on and there wasn't really a changing long term focus. I think that's the feeling of it. And it was all quite slick and all quite glossy (CL*)	Ensure clarity, consistency and transparency for the case for change and use appropriate language
Not having a (perceived) open and transparent communication and engagement process	I just think that probably a more open and transparent process, they might have done a better job at engaging staff and not having such a – untrusting- I kind of felt like staff…don't trust the whole process because there was no transparency or honesty from the beginning (CL*)	Ensure communication and engagement processes are open, transparent and engender trust
Lack of local communication and engagement plans	Each of the LHNs were responsible for actually doing their own LHN communications plans…and I think the importance of those …plans with the staff were probably undervalued and not engaged. While we did consultation at a state wide level …we then assumed that people on the ground …were consulting within their networks…that assumption may have been a gap in communications.. (CL*)	Consider how central messages are translated appropriately at local level
Maintaining an isolationist approach	I see pockets of collaboration but also seeing frustrations where the collaboration hasn't been taking place that it needs to…I guess I've seen cynical patterns as well, that as Transforming Health has come towards an end or people have seen it coming towards its ..end, some of those old silos have started to re-establish themselves as turf wars start to play out to try and go back to the older way of operating…(CL*)	Actively address group that wish to remain separate or apart from the main initiatives
Not taking consumer feedback seriously: divide between positive and negative experiences within the same location for the same model of care	'I was up on Level X and people that I had there they actually listened to what I was saying most of the time. But I had a really good experience all round. (Patient*) …the people unfortunately talk at you rather than with you and my dad was 91, he had a fully functioning mind and unfortunately we found that sometimes people didn't involve Dad in the decision making (Carer*)	Value and respect consumer feedback and act upon it

*PM=Project Manager, CL=Clinical Lead. Quotes from *Staff Engagement* Theme
Patient and carer quotes from *Patient Centred Experience* Theme

Domain 5: Clinical Engagement

Undoubtedly clinicians will be interested in exploring whether the expected improvements in clinical outcomes across the four models of care were achieved and if not, why not. As stated throughout this report, the evaluation was not designed to answer this simple question. What we have unpacked is a much more realistic and pragmatic picture of complexity at work: the positives from Karnon and O'Callaghan's "Clinical Outcomes" Theme show clinical trends in the right direction (see **Section 10.3.4**) but we cannot attribute these small improvements to Transform Health alone. Nor do we need to.

What we have learned from the diverse data sets we have interrogated is a set of working principles identified by clinicians as being essential for optimising the potential for successful improvement in clinical care.

These relate to:

- Prioritising clinical improvements within health systems using population health baseline data, hospital utilisation data and identification of high risk groups.
- Access to and use of routinely collected clinical and cost data per LHN and model of care.
- Developing skills and competencies around techniques such as continuous quality improvement; simulation and modelling techniques and understanding system variation to plan service improvements.
- Investing in leadership development for all members of the interdisciplinary team that emphasises the importance of transparent governance processes, role clarity, managing resistance to culture change and improvements, and addressing silo working.
- Looking for synergies with local university partnerships which will drive up the skills and knowledge pool and promote better exchange and translation of evidence into practice.
- Understanding what a patient-centred health system looks like and the values which drive it.

Our work has also reinforced the importance of clear governance processes, transparent messaging and authentic engagement of stakeholders. Some aspects of Transforming Health achieved great success in these areas (as indicated in **Tables 6, 7** and **8**) while other experiences identified areas for improvement.

Table 9. Domain 5: Clinical Engagement (Staff learnings to consider about the effective involvement of clinical leaders, clinicians and support staff from all disciplines)

Findings synthesised from the evaluation	Quote	Recommendation
Prioritising of clinical service improvements using credible population and clinical health data	There are disparities with SA by remoteness of residence, socio-economic status, and Aboriginal status. Each disparity warrants individual interpretation and decision-making as to likely causes and amenability to remedial action, In that context, the data provide a 'road map' to consider in action plans. (Pop Health Theme)	Invest in ongoing benchmarking of population profile and use to set priorities
Use of routine clinical and cost data	The greatest shared ground between clinical leads was the need for timely accurate data to inform practice and decision-making. Issues raised included: ongoing and real time access to data and health information to improve current practices, patient outcomes and informed decision-making; and accuracy of data used to mount the case for service redesign (in this case TH but in future other iterations of service improvement). (*System Outcomes* Theme)	Invest in ongoing development of clinical data systems that can be used by clinical teams in real time
Development of new skills and techniques	Around understanding patient flow and use of techniques to analyse flow and simulate small changes to the whole system before embarking on a major project (*System Outcomes* Theme)	Engage more explicitly with continuous quality improvement and simulation techniques to guide service improvements
Invest in leadership development	The (leadership) training is only going to be as effective as, you know, the cultural attitude of the organization for change… if you're not going to have a culture that's going to support you implementing that leadership style or approach within the organization, it's all for nothing...investing in enough time for people to actually come in and implement their learnings…they talk about the strategic, the operational and the tactical. Well, everybody's living in the tactical all the time…they don't have enough time to get to the strategic..' (*Staff Engagement* Theme)	Commit to ongoing leadership development and education of clinical staff. Acknowledge the importance of leadership to change negative or resistant cultures
Nurture relationships with local universities	Professorial links with a university were considered to be an advantage for innovation, continual improvement and evidence-based practice (*System Outcomes* Theme)	Actively pursue university clinical partnerships
Towards a patient-centred system	It was evident that while patients could be treated under the same model of care and in the same therapeutic environment, they could have very different care experiences sometimes very positive and sometimes very negative. This suggests there is opportunity to explore and improve consistency of care processes within models of care. (Patient Centred Experience Theme)	Understand what a patient-centred system looks like and actively work toward achieving it.

6. Discussion

So far, this report has been relatively atheoretical in approach. This means that the rationale for the proposed change to SA Health activity was not based on a prevailing (evidence-based) approach to effective change management or cultural change, and that the subsequent Evaluative Case Study had to generate a set of assumed propositions that guided the activity of the change managers and leaders of Transforming Health initiatives. This lack of theoretical appreciation, awareness or insight is not uncommon; but it does create challenges for evaluation teams who are then required to make sense of what happened in the evaluation process and why. Often clinicians obsess over clinical outcome data without realising or appreciating that effective clinical outcomes are as much a product of effective system, team and individual cohesion and performance as they are to some 'magic bullet' that can be fired into a system that can change multiple situations.

In order to conclude the work of the Transforming Health Evaluation Working Group, it was important for us to identify the (implicit) theoretical perspectives which we thought might be driving the Transforming Health agenda and subsequently help us consider how we could build upon these learnings for future evaluation efforts. As we know from the literature (Owen & Rogers, 1999; Westhorp, 2015), ideally, evaluations of system change, and in particular whole scale system change as contemplated by Transforming Health, should be planned, constructed and resourced as an integral part of the strategy. Despite the significant investment in the early planning, monitoring and implementation stages of Transforming Health, no consideration was given to the evaluation efforts. It is important to acknowledge the efforts of the Clinical Ambassador for Transforming Health, Professor Dorothy Keefe and the SA Department for Health and Ageing, who both believed that it was vital for an evaluation to take place. The result was a 'post-hoc' evaluation plan which attempted to undertake with some rigour an evaluation of the processes of the system change.

This 'after-the-fact' approach to evaluation is not that uncommon: the important thing is to acknowledge the limitations; embrace the consistent messages; implement them and ensure that future evaluations improve in design, methodology and method. As acknowledged previously, the Transforming Health evaluation, along with the plan was devoid of any theoretical infrastructure. The evaluation approach, of necessity, had to be focused, pragmatic, drawing from multiple sources of routine and newly generated data, which could be analysed in a relatively short timeframe. We achieved all these objectives and have now been able to stand back and reflect on some of the theoretical insights to be generated from the data.

The first 'enabler' for us to more fully understand the importance of our work was to compare the results with Best et al's (2012) realist review of large scale transformation projects in health care. Best's team was asked to analyse examples of successful and less successful transformation initiatives used to introduce large scale health system change; to synthesise knowledge of the underlying mechanisms that led to success; to clarify the role of government in these (successful) initiatives and to outline options for evaluation. Their rapid review (conducted over a period of six months) identified what they called (according to complexity theory principles, which their review had embraced) five 'simple rules' of large-scale transformation in health care that were likely to enhance the target initiatives. These were:

- Engaging individuals at all levels in leading change efforts through blending designated (a role) leadership with distributed (a function) leadership
- Establishing effective feedback loops
- Attending to the history and culture of the organisation(s)
- Engaging physicians (or medical staff)
- Including patients and families in the transformation process.

They found that these principles play out differently in different contexts, affecting human behaviour through a wide range of different mechanisms used to shape the desired behaviour. Best's team also considered the theoretical lens with which they wanted to frame future, large-scale, system transformations. The literature was divided between two dominant paradigms: top-down approaches where power and control were vested in a ruling hegemony or a complex adaptive system (CAS) approach, which draws out and mobilises the natural creativity of healthcare professionals to adapt to circumstances, and to evolve new and better ways of achieving quality. The theoretical position taken by Best's team in analysing the literature was therefore one which supported a work environment conducive to harnessing relationships and skills and capabilities of individuals in the system (Best et al., 2012). The observable consequences of such theoretical positions were a reduction in the importance of targets and more investment in support and guidance for staff, and a deliberate decision of the organisation to changing principles by which people carry out their roles and work together, which is more important than attempting a predefined target.

Table 10 summarises the synthesised findings from the realist review, illustrating the alignment between the literature review findings of successful large system transformations and the findings from the Transforming Health Evaluation. Of note are the areas of very poor and poor alignment (identified as a -- or - in the third column of the table); low alignment (+); moderate alignment (++); and good alignment (+++).

It is clear from this critique which are the areas that Transforming Health focused on: engaging clinicians (but omitting some of the key mechanisms to keep clinicians on board); establishing feedback loops (excellent initiatives which require refinement); engaging individuals at all levels in leading change efforts (identifying designated and properly trained change facilitators); and involving patients and families. One area which seemed to be universally lacking was the 'attending to history' simple rule. It may be because the implicit approach to the SA Health changes were 'top down', rather than based on complexity theory, that views about the importance of attending to the history and experiences of clinicians and people working in the system were dismissed. This seemed to be the case for both clinicians and consumers alike.

Table 10. Summary of synthesised findings from the realist review and findings from the Transforming Health Evaluative Case Study

Best el al 2012 realist review of large scale transformations in health care	TH Evaluative Case Study interpretation	Alignment
Simple Rule 1. Engage individuals at all levels in leading the change effort	Perceived in SA Health system to be led by the centre and did not engage all levels in leading the change effort although TH aspired to do this	+
Explicit alignment of values and goals consistent with resource allocation and actions	Values and goals articulated but problems with alignment with business plan	+
Active management of strategy through designated change agents	Clinical Leaders and Project Managers for discrete models of care identified but challenges with role clarity, accountability and ability to act at local level	+
Using small scale pilot projects	No evidence that PDSA or simulation activities were encouraged as part of the process	-
Assumes that staff will not be penalised for taking actions that are part of change strategy implementation	Staff at local level talked about problems with accountability and role delineation	-
Simple Rule 2. Establish feedback loops	Strong feedback on the importance of using credible data to create ways of understanding what was happening both clinically and from a resources point of view	++
Active participation of all stakeholder groups to determine nature and range of measures used	Beginning culture in engaging clinicians, teams and SA Health in sharing and analysing data	++
Confidence and trust in measures selected	Multiple comments on the importance of being able to trust data sources but little evidence that this was happening routinely	+
Knowing how to interpret data	Enthusiastic clinical leaders and Project Managers talking about the importance of this at a local level	++
Ability to review, revise and refine data	Few comments about this at local level: participants getting used to the fact they had data to interpret	+
Consistent and equitable application of data	System in early stages of development and some commentaries were concerned about old way of working being re-introduced after the end of TH – indicating that there was not a belief that data would be applied consistently or equitably	-
Agreement on what to do with results and consistency of actions from feedback	System in early stages of development – desire from some commentators to have results transparent across clinical areas and LHNs; others were less enthusiastic. At least the conversations were beginning	+
Simple Rule 3. Attend to history	No evidence of explicit acknowledgement of the history of the SA Health system or for the lived experiences of the participants working in it or using it as consumers	-
Educating the leadership throughout the system about previous change efforts and their outcomes, contextual factors and mechanisms that were influential either positively or negatively, and relation between past effort and current plans	Multiple comments about the conflicting data used to start the change; how different stakeholder groups challenged the data and how multiple groups felt excluded (consumers, Aboriginal people, local staff). Little belief in the case for change – view that it was 'contrived'	-
Building on familiar and valued ideas and activities	No evidence that local histories were acknowledged or respected in the change process. In fact many experienced a sense that value and history were being ignored	--

Best el al 2012 realist review of large scale transformations in health care	TH Evaluative Case Study interpretation	Alignment
Simple Rule No 4. Engage physicians	A very active strategy was developed around clinician (and in particular medical/physician) engagement	++
Alignment of professional and regulatory drivers	No explicit attention was given to the alignment of medical professional and regulatory drivers, possibly why there was significant union involvement	--
Strength of incentives	No explicit consideration was given to the incentives that could be used to change/ modify/alter physician behaviour. This also may have inadvertently fed into the resistance from some physicians who maintained a distance from TH activities and who regressed to old behaviours when TH was declared completed.	--
Facilitation and guidance through the process-dedicated change manager	Confusion dominated the roles of clinical leads, their ability to implement new models of care and the resources they had to do this. Even though they and their Project Managers were committed, they did not have the authority or the clear support of dedicated Project Managers to complete the task	-
Professional directives and examples through the engagement of physician leads and colleges/ associations in all aspects of the change process	There was a failure to engage the professional colleges/ associations proactively, which meant that dialogue became reactionary and problem rather than solution focused	-
Simple Rule No 5. Involve patients and families	The rhetoric of Transforming Health was to create a health system which was more aligned to meeting the needs of the South Australian public – attempts were made to live up to this vision but many improvements could be made	+
Heighten awareness by policy makers and change agents of patients' perspectives and priorities	Evidence suggests that the consumer engagement activity has still some way to travel before it's embedded in policy makers' awareness and understanding. However, the desire to do this seems to be there.	+
Heightened sense of validity – metrics reflect patient priorities	Confusion over how patient experiences are recorded although the TH work did alert stakeholders to doing more work in this area	+
Heightened sense of equity – metrics are inclusive and equitable	Very strong sense from consumers and vulnerable stakeholder groups that a lot more work needs to be done on achieving a heightened sense of equity in change programs	-

Table 10 summarises the synthesised findings from the realist review, illustrating the alignment between the literature review findings of successful large system transformations and the findings from the Transforming Health Evaluation.

Key:

-- very poor alignment

- poor alignment

+ low alignment

++ moderate alignment

+++ good alignment

7. What can we learn from this Evaluative Case Study of Transforming Health?

What we can deduce from our work is that it is possible to generate a narrative around the experiences of multiple stakeholders, going through a large-scale system change, in ways that both acknowledge the limitations of the data but support the emerging themes from the data, and from other (realist) literature reviews.

The synthesised results and the comparison with the findings of the Best et al (2012) review do point to practical actions that could be considered for subsequent service improvements – whether they be large scale, moderate or local. We would suggest the simple rules from the Best et al (2012) review, and the synthesised findings from the Evaluative Case Study, would offer good direction and advice to move things forward.

7.1 An observation about preparedness for implementation and evaluation activities.

It must be stated in this document that there is a continued element of surprise (and frustration) that significant whole system transformation can be embarked upon without due attention being paid to the underlying data; the need for change; and the explicit implementation of evaluation frameworks. Hopefully, with the proliferation of Advanced Health and Research Translation Centres (AHRTCs) in Australia there will be a growing awareness of, and realsation that such investments need proper science and investment underpinning them.

The Transforming Health initiative was an early and bold attempt to generate change within a (relatively conservative) system. It has worked in part but most importantly the evaluation has generated a list of recommendations, based on the evidence to guide our further action. Our experiences and results have also been validated by what existing external evidence there is from reviews.

SA Health has stated that it has an ongoing commitment to evaluation as described by the then Minister for Health "…to provide the evaluative lens, including a longitudinal study of the impact of Transforming Health" and to "undertake the ongoing evaluation of our transformative changes" (Minister for Health, 2015a, p. 12).

Supporting the coordination of this evaluative process in cooperation with the Evaluation Working Group and the SA Centre was a demonstration of this commitment. It is anticipated that a 'Phase 2' of this evaluation could investigate aspects of Transforming Health that were not able to be covered in Phase 1. This would be a valuable outcome for all stakeholders in South Australia.

The SA Centre and the authors of this report want the findings of this report to be used as the catalyst to ensure that evaluation activities are incorporated into the design of future health system and service reform and not undertaken as an add on. Additionally, the recommendations from this report must be used to guide health service redesign in SA now and in the future. SA Health is poised to take that step.

8. Recommendations

There are 23 recommendations to carry forward to any future whole (or smaller scale) system transformations based on the Evaluative Case Study of aspects of Transforming Health. These are:

Domain 1: Data driven and informed service improvements

- SA Health, LHNs and PHNs should consider data, such as in the Population Health Report, when aligning priorities.
- Increase capacity for the analysis and reporting of contemporary clinical and cost data to supoort the timely identification of priority areas for improvement.
- Consider governance processes which embrace transparency of data and ability to compare across sites.
- Consider ways to routinely collect and integrate patient reported outcomes and experience with clinical data to understand the full picture
- Ensure all staff voices are heard in the system, for example, introduce consultation and feedback processes around reported performance data that involve all staff.

Domain 2: Governance arrangements

- Pay attention to building and sustaining trusting relationships to lead the system changes.
- Clarity around what is disclosed and how it is shared.
- Consider the organisational models which separate the operational activity of health departments with organisations established to lead system innovations and improvements.
- Be clear what is in and out of scope and actively manage engagement processes.

Domains 3&4: Effective communication and engagement

- Build on the standard setting and models of care workshops to promote patient-centred journeys.
- Actively celebrate achievements.
- Ensure clarity, consistency and transparency for the case for change and use appropriate language.
- Ensure communication and engagement processes are open, transparent and engender trust.
- Consider how central messages are translated appropriately at local level.
- Actively address groups that wish to remain separate or apart from main initiative.
- Value and respect consumer feedback and act upon it.

Domain 5: Clinical engagement

- Invest in ongoing benchmarking of population profile and use this to set priorities.
- Invest in ongoing development of clinical data systems that can be used by clinical teams in real time.
- Engage more explicitly with continuous quality improvement and simulation techniques to guide service improvements.
- Commit to ongoing leadership development and education of clinical staff. Acknowledge the importance of leadership to change negative or resistant cultures.
- Actively pursue university-clinical partnerships.
- Understand what a patient-centred system looks like and actively work toward achieving it.

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10. Appendices

10.1 Case Study Ethics and Governance Approvals

THEME AREAS	SA Health Human Research Ethics Committee Reference Number	Site Specific Assessment/Research Governance Approval LHNs SSA Reference				
		SALHN	CALHN	NALHN	WCHN	DHA
Patient-Centred Experience	HREC/17/SAH/62	N/A	MyIP9336 SSA/17/RAH/269	SSA/17/ NALHN/56	N/A	SSA/17/ SAH/93
Staff Engagement	HREC/17/SAH/52	N/A	N/A	N/A	N/A	SSA/17/ SAH/59
Clinical Outcomes	HREC/16/SAH/66	N/A	N/A	N/A	N/A	SSA/18/ SAH/7
System Outcomes	HREC/17/SAH/80	SSA/17/ SAC/303	MyIP9532 SSA/17/RAH/361	SSA/17/ NALHN/76	SSA/17/ WCHN/140	SSA/17/ SAH/103
Population Health Outcomes	HREC/17/SAH/63	N/A	N/A	N/A	N/A	SSA/17/ SAH/71

10.2 Case Study Tasks and Timeline

Date	Task
PLANNING	
August 2016	**Workshop:** led by Clinical Ambassador for Transforming Health, to engage with stakeholders and inform the development of an Evaluation Framework for Transforming Health.
October 2016	**Working Group** commenced monthly meetings.
October 2016 – March 2017	**Program Logic** developed to facilitate thinking, planning and communications about Transforming Health objectives and actual accomplishments. **Key Themes** identified: • Population Health Baselines • The Patient Centred Experience • Staff Engagement • Clinical Outcomes • System Outcomes
March – April 2017	**Case Study Framework** developed to document key areas of the evaluation and the timeframe for completion of tasks. **Key Questions** generated for each Theme.
May – November 2017	**Ethics & Governance Applications:** prepared and submitted to Department of Health and Ageing Human Research Ethics Committee and SA Health Research Governance Officers in the Local Health Networks.
IMPLEMENTATION OF CASE STUDY BY THEME LEADS	
July 2017 – January 2018	Evaluation questions, specific to each Theme, generated from Program Logic. Measures and indicators needed to investigate evaluation questions were defined. Existing data accessed with assistance of SA Department of Health and Ageing Data & Reporting Services. Additional quantitative and qualitative data needed was identified and accessed e.g. external surveys, qualitative data via interviews and focus groups with patients, carers and staff Data analysed and Theme Reports written
PREPARING THE REPORT	
16 February 2018	Working Group Brainstorming session to: • discuss first drafts of Theme Reports • plan writing of final report
Feb – March	Writing of final report
31 March 2018	Final report completed.
April 2018	Report reviewed by SA Translation Centre Executive Group.
May 2018	Report presented to SA Health
SHARING FINDINGS	
April – June 2018	Planning for: • sharing results with stakeholders • incorporating results into a continuous improvement model to become business as usual
June 7 2018	**Seminar**: Health System & Service Reform in South Australia
30 June 2018	Paper on each Theme to be submitted to appropriate journal by Theme Leads. Paper on Case Study for conference presentation/submission to appropriate journal.

10.3 Individual Theme Reports

10.3.1 Population Health

10.3.2 The Patient-Centred Experience

10.3.3 Staff Engagement

10.3.4 Clinical Outcomes

10.3.5 System Outcomes

10.3.1 Population Health

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1. Executive summary

With the launch of TH in early 2015, little follow-up time has elapsed to investigate health effects at a population level. With South Australia not having a comprehensive data set that could provide this background information, the opportunity was taken to generate a subset of data identifying baseline levels of health, time trends and disparities. This can assist service planning and establish benchmarks for later evaluation.

The following evaluation questions were asked: What are the variations in:

- health outcomes and time trends for SA compared with national outcomes and trends?
- health outcomes for priority population groups in SA, e.g., low SES, geographically remote, and Aboriginal and Torres Strait Islander people?
- hospitalisation rates by local health networks and primary health networks?

Direct standardization by 5-year age group (0-4, 5-9…85+ years) has been used, employing unit-record files from the ABS (mortality data for 2003-2015) and SA Health ISAAC (Integrated South Australian Activity Collection) data for 2009-2016. The standard reference population was generally the Australian population at mid-2011, although the mid-2001 population was also used for data extracted from other sources that used this reference year, as cited in the report.

Results show that SA generally has very similar life expectancies at birth, and similar mortality and hospitalization rates, pregnancy outcomes, and cancer survival outcomes to Australia as a whole. It has experienced equivalent reductions over time in age-standardized death rates from all causes of death combined, and there are disparities within SA by remoteness of residence, socio-economic status, and Aboriginal status.

Each disparity warrants individual interpretation and decision-making as to likely causes and amenability to remedial action. In that context, the data provide a “road map” to consider in action plans.

In general, South Australians report a similar overall status of health to Australians overall, but there are individual areas of potential disparity that warrant attention. They include actions in primary prevention to address lack of exercise and raised BMI (especially in the metropolitan area) , inadequate fruit intake, and in outer regional and more remote areas in particular, elevated tobacco smoking rates and excesses in single-episode alcohol consumption.

These data provide benchmarks that will be useful comparators in later evaluations. The same data sources should be used to facilitate these comparisons, although more focused development of additional metrics may be taken for health areas that are selected for special attention. In general, further and more detailed analyses are required to determine causes and facilitate service targeting.

2. Introduction

2.1 Background

An overarching aim of Transforming Health (TH) has been to optimise SA health gain from available resources by increasing health-service effectiveness and efficiency in ways that are acceptable to the SA public and which meet the needs of priority groups (e.g., the aged, socio-economically disadvantaged, geographically remote, Aboriginal and Torres Strait Islander people, "at risk" CALD populations, the homeless, new arrivals and disabled).

With the launch of Transforming Health in early 2015, little follow-up time has elapsed to investigate health effects at a population level, but baseline levels of health, time trends and disparities can be identified to assist service planning and establish benchmarks for later evaluation. These baselines and trends are presented in this report. They are derived from analyses of mortality, hospitalization, health-related registries and databases, and self-reported survey data for SA as a whole, priority sub-groups, and where relevant, health-service sectors (public and private). The hospital utilization data require careful interpretation because utilization would be affected not only by health needs but also by provider and patient preferences, service access, use of non-hospital services, and local referral pathways.

2.2 Evaluation Questions

1) What are the variations in health outcomes and time trends for SA compared with national outcomes and trends?

2) What are the variations in health outcomes for priority population groups in SA, e.g., low SES, geographically remote, and Aboriginal and Torres Strait Islander people?

3) What are the variations in hospitalization rates by local health networks and primary health networks?

2.3 Overview

This report should be regarded as a high-level overview of "work in progress". The aim is to describe the big picture and to produce markers of health trends and disparities for benchmarking and where appropriate, prompt attention. Depending on the marker, further investigation would generally be required for targeting service initiatives. For example, marked differences are recorded in diabetes mellitus mortality and hospitalization rates by Aboriginal status, residential remoteness and lower socioeconomic status, but these demographic characteristics commonly co-exist, and further analyses would be needed to separate out individual effects for targeting service responses.

Where possible, comparisons are drawn between data for SA and Australia overall and International Classification of Diseases (ICD) and procedure codes have been used to gain comparability. Direct standardization by age has been used in most analyses to remove age effects from reported differences. Again, this is a summary measure that does not reveal variations in differences across ages, nor across Australia by ethnicity where significant differences in recording of Aboriginal status are likely to be a confounding factor. Analyses were presented, where relevant by health-service sector, Local Health District (LHD) and Primary Health Network (PHN) of residence. Again, the present results should be regarded as high-level flags that generally would warrant "drill-down" analyses by expert groups with specialized content knowledge for targeting interventions.

Broad groupings of health conditions are included in this report, including chapters of the International Statistical Classification of Diseases and Related Health Problems (ICD-10-AM). An extreme example is "Mental and Behavioural Disorders" (ICD-10-AM chapter 5) which cover a wide range of conditions, such as dementia, adverse effects of alcohol consumption, and effects of other psychoactive substance use, psychoses and neuroses, and a range of other mental conditions. Hospitalization rates varied significantly for this chapter of conditions by socioeconomic status, Aboriginal status and Local Health Network, but further analyses would be needed to identify the conditions responsible for each of these variations for planning a service response.

Perinatal mortality, and where feasible, infant mortality (first 12 months from birth), have also been investigated, along with the low-birth rate and low-Apgar scores across priority groups in SA and through comparison with national data.

Cancer survival has been explored for leading cancer types and compared across SA sociodemographic sub-groups. High-level comparisons have been made with national survival data. While this provides a useful perspective, there would be minor differences due to methodological differences, such that comparisons should be interpreted broadly.

This initial report uses available data. Its novelty is the use of a standard analytical methodology wherever possible across multiple data sets to facilitate comparisons over time and between priority groups. It sets the stage for subsequent evaluation and monitoring by exploring trends and differences in mortality and morbidity for use as benchmarks and baselines. It also shows differences that may inform service planning.

The data show:

- Trends in age-standardized mortality overall and for selected conditions;
- Differences in age-standardized mortality, hospital-admission rates, and self-reported health and risk-factor data by residential-area remoteness and socio-economic status, and where relevant, Aboriginal status, Local Health Network and Primary Health Network; and
- Differences in pregnancy outcomes and cancer survival.
- Where indicated, broad comparisons with national and interstate data.

3. Methods

Direct standardization by 5-year age group (0-4, 5-9…85+ years) has been used, employing unit-record files from the ABS (mortality data for 2003-2015) and SA Health ISAAC (Integrated South Australian Activity Collection) data for 2009-2016. The standard reference population was generally the Australian population at mid-2011, although the mid-2001 population was also used for data extracted from other sources that used this reference year, as cited in the report.

While 95% confidence limits were used to indicate extent of random variation for mortality data, this methodology was not used for hospital data due to multiple events at a person level and the inability to adjust for a lack of independence of these events across different hospitals. Instead, differences for health conditions and hospital procedures where ranked by strength of evidence, with the 25% of conditions providing the strongest evidence of real differences being highlighted in this report. This strength of evidence was determined by standard probability testing but with only the most extreme probability values being used to avoid false positives.

Pregnancy outcomes were analysed using Australian national classifications and uniform methodologies to form comparisons with national and interstate data. Relative survival was used to indicate five-year survivals for all invasive cancers combined and common cancers. The period method was preferred for comparability with national data previously presented by the Australian Institute of Health and Welfare (AIHW). Again, small differences in survival between SA and national data should be disregarded due to potential differences in methodology, as related for example to death follow-up and data-linkage sensitivity and specificity.

Comparisons were made by Aboriginal status, remoteness and socioeconomic status of residential area. In general, Aboriginal status was obtained from death and hospital records. The results are considered to be indicative of health disparities but should not be interpreted as precise due to variations in completeness and accuracy. Statistical Local Areas (SLAs) of residence were used to classify by remoteness (major city, inner regional, outer regional, and remote and very remote) and socioeconomic quintiles, as described in AIHW reports.

The utility of join-point and other statistical methods was explored to detect changes in mortality trends. It is expected that these and other methodologies will be used in later evaluations to explore changes that follow Transforming Health and other health-system and population health initiatives.

Mortality, hospitalization and corresponding self-reported survey data have been analysed for: all health conditions combined; major ICD-10 3-digit disease groupings; and more specifically for cerebrovascular disease (stroke); ischaemic heart disease; diabetes mellitus; malignant neoplasms by type; pneumonia and influenza; osteoporosis; fractured neck of femur; and other selected diagnoses and procedures as population health and system-performance markers. These procedures included knee arthroscopy, lumbar spine surgery, hysterectomy and endometrial ablation, tonsillectomy, myringotomy, radical prostatectomy, hip fracture, hip replacement, and caesarean section, as well as additional procedures of potential relevance.

4. Results

Note: source data for these analyses can be sought through the relevant data custodians. Advice on this process could be sought through SA Health (A/Director, Data and Reporting Services, SA Health).

4.1 Mortality

SA compared with Australia overall (2010-2014)

- The all-cause standardized mortality rate (SMR) was very similar (2% higher) during this period for SA and Australia overall. There was a marginal elevation for SA that may be real, with a 95% confidence interval between 1.2% and 2.7%.
- Disease categories contributing to this elevation include dementia (including Alzheimer's disease) at 21% higher than for Australia as a whole, septicaemia at 17% higher, suicide at 12% higher, influenza and pneumonia at 10% higher, liver disease at 8% higher, diabetes mellitus at 7% higher, and kidney failure at 7% higher. Some cancer types also contributed, including lymphoma at 14% higher.
- Lower SMRs also occurred in SA, including for lung and prostate cancers, which had offsetting effects
- SA had slightly higher all-cause SMR than NSW, Victoria, Western Australia and the ACT during 2010-2014, but a lower all-cause SMR than for Tasmania and the Northern Territory.

SA compared with Australia overall (2003-2015) (Figure 1)

- SA had very similar all-cause mortality rates to Australia overall during 2003-2015
- The all-cause SMR for this longer period was also very similar for SA and Australia overall. Again, there was a very slight elevation for SA with a SMR 1% higher than for Australia overall.
- Disease categories contributing to an elevated SMR in SA included asthma with a 16% higher SMR than for Australia overall; mental health and behavioural disorders at 10% higher; nervous system diseases at 8% higher; respiratory system diseases at 4% higher; and ischaemic heart disease at 2% higher.
- Diseases with lower SMRs in SA than for Australia overall included diseases of the musculoskeletal system and connective tissue, with a SMR 18% lower.
- Differences were too small to greatly affect life expectancy at birth, which was essentially the same for SA and Australia overall (2014-2016 data) at 80 years for males and 85 years for females. Similar life expectancies applied by State and Territory, although with discernibly lower life expectancies for Tasmania and (more so) the NT (Figure 2).

Figure 1: SA annual age-standardized mortality rate (95% CL) (Aust. 2011); 2003-2015*

– Australia rate set to "100" –

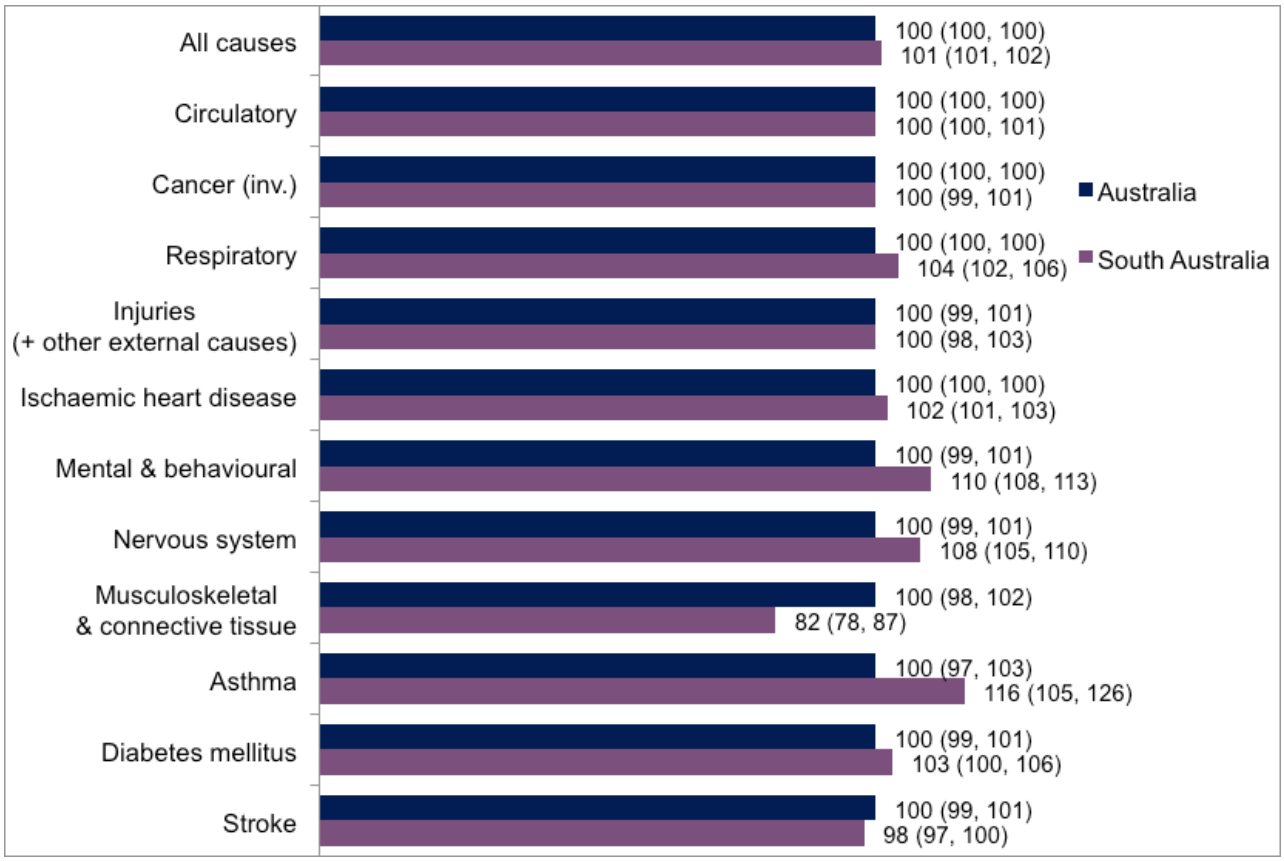
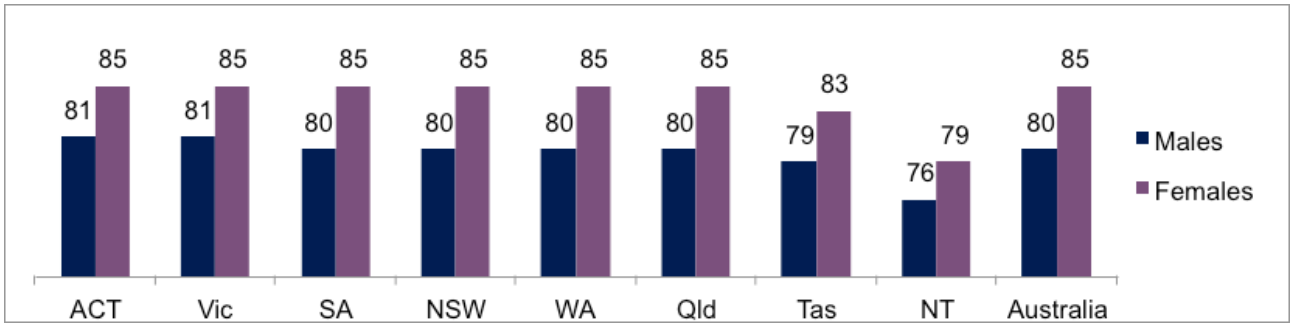


Figure 2: Life expectancy at birth (years); 2014-2016*



SA cancer mortality compared with Australia (2009-2013)

- Additional AIHW data available for all invasive cancers collectively indicate a 1% lower age-standardized mortality rate for SA than nationally, with a 95% confidence range between 1% and 2% lower than the national rate. The lowest rate applied to the ACT (12% below the national rate) and the highest to the NT (25% higher than the national rate).
- Analyses by cancer type showed a higher age-standardized mortality rate for SA than nationally for lymphoma (Hodgkin and non-Hodgkin combined) (14% higher), but a lower age-standardized mortality for melanoma (skin) (21% lower).

SA time trends compared with Australia overall (2003-2015)

- All-cause SMRs reduced by 12% between 2003-2005 and 2015, both for SA and Australia overall (**Figure 3**). They were influenced by reductions for circulatory diseases, cancer, respiratory diseases, and cerebrovascular disease (stroke) (**Figures 4-7**). By comparison, there was little evidence of a change for injuries, poisonings and other deaths from external causes (Figure 8). While SA experienced an increase in mortality from diabetes mellitus of about 10% during this period, this was small in magnitude and attributable to chance (p>0.05) (**Figure 9**).

Figure 3: Age-standardized (Aust. 2011) all causes mortality rate per 100,000; 2003-2015*

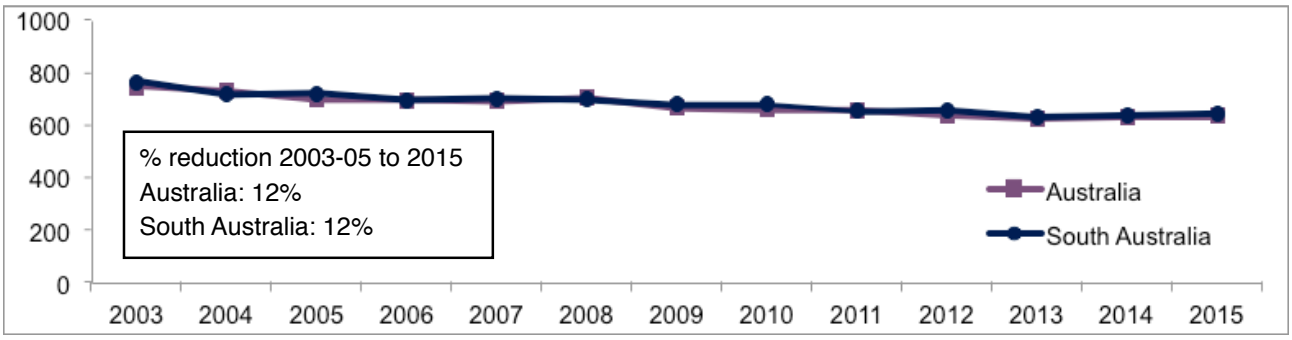


Figure 4: Age-standardized (Aust. 2011) circulatory diseases mortality rate per 100,000; 2003-2015*

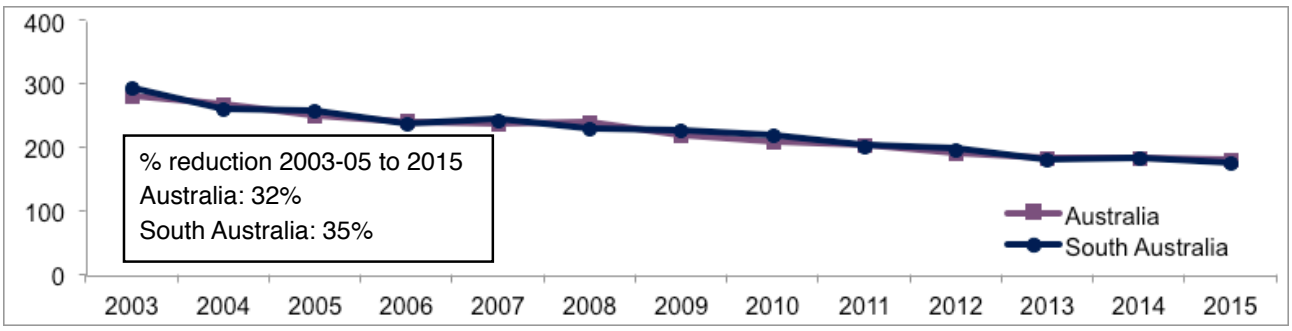


Figure 5: Age-standardized (Aust. 2011) cancer (invasive) mortality rate per 100,000; 2003-2015*

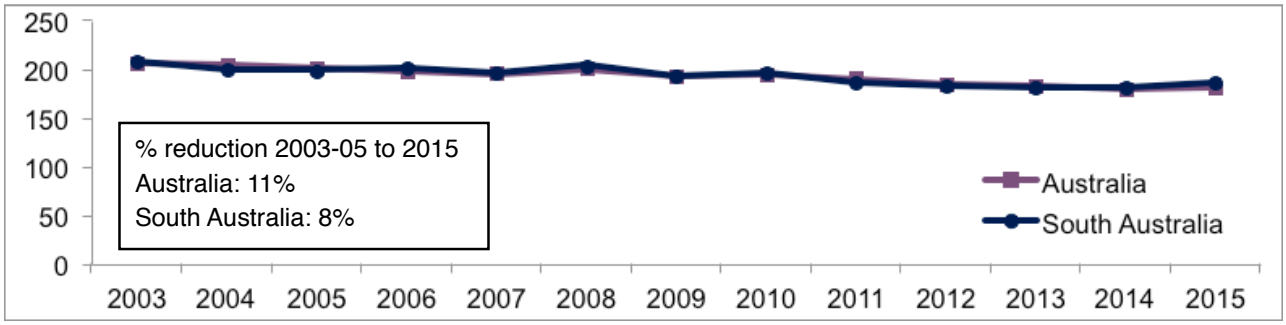


Figure 6: Age-standardized (Aust. 2011) respiratory diseases mortality rate per 100,000; 2003-2015*

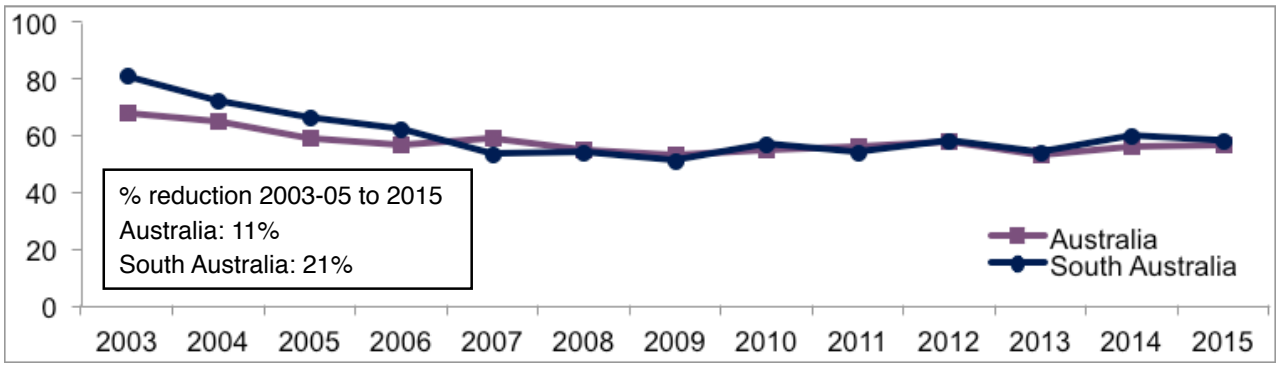


Figure 7: Age-standardized (Aust. 2011) stroke mortality rate per 100,000; 2003-2015*

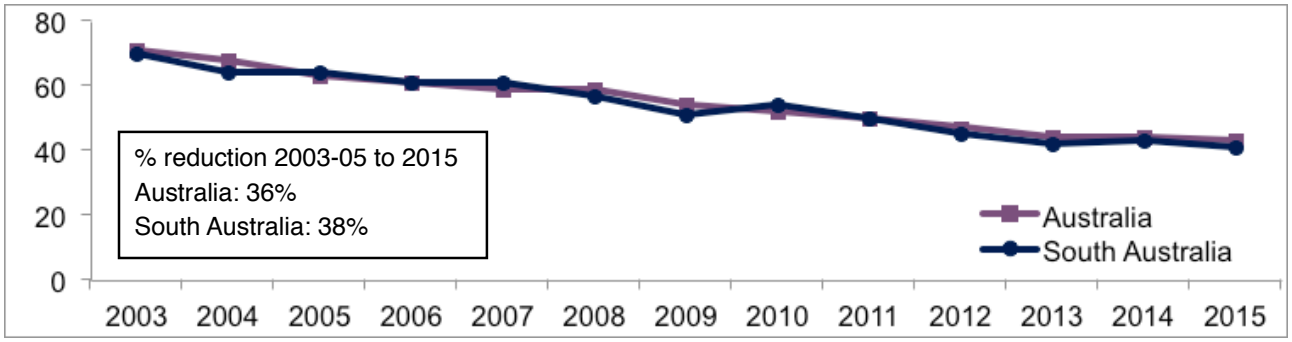


Figure 8: Age-standardized (Aust. 2011) injuries (+ other external causes) mortality rate per 100,000; 2003-15*

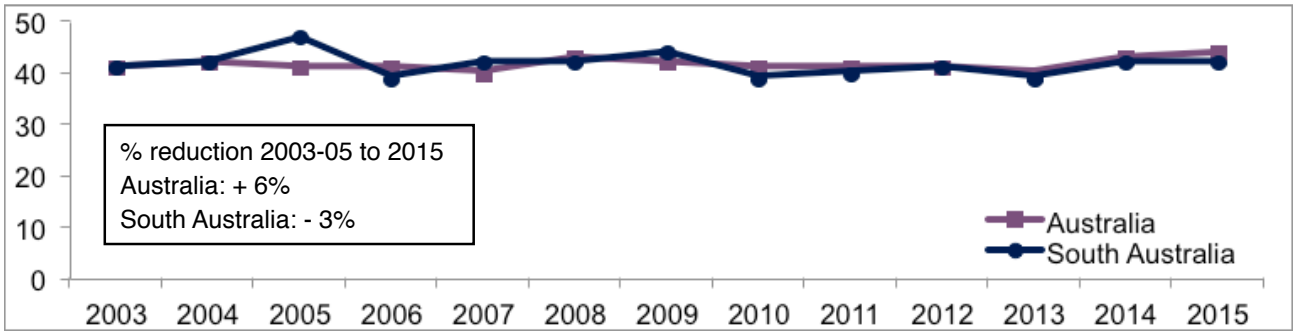
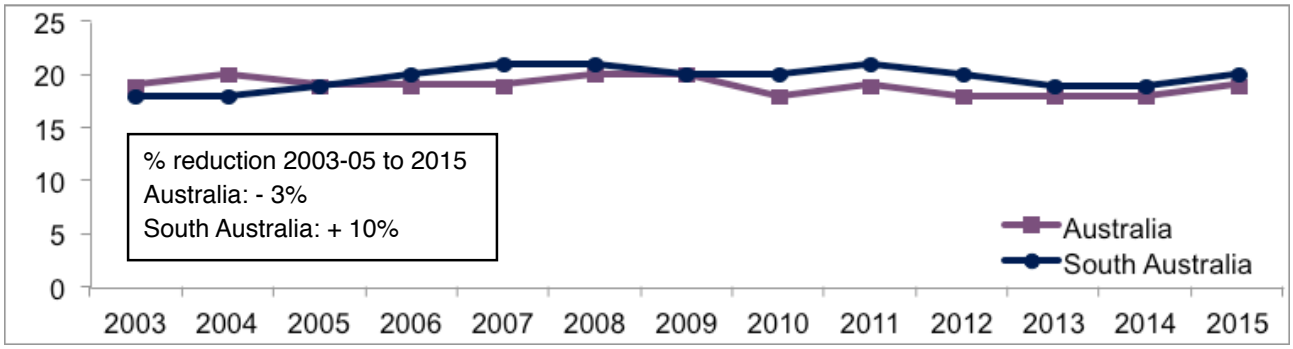


Figure 9: Age-standardized (Aust. 2011) diabetes mellitus mortality rate per 100,000; 2003-2015*



- SMRs showing an upward trend in SA included symptoms, signs and abnormal findings not recorded elsewhere (a 188% increase, as compared with 54% for Australia), mental health and behavioural disorders (a 105% increase, as compared with 97% for Australia), and nervous system diseases (an 82% increase, as compared with 35% for Australia).
- Join-point analyses of 2000-2015 SA data showed changes:
  - (a) in downward trends during 2003-2015: for all causes combined - from: 2005, 2008, and 2013; for ischaemic heart disease - from 2006 and 2009; for all circulatory disease combined – from 2005, 2009, and 2013; for respiratory system diseases – from 2007; for genitourinary system diseases - from 2011; for colorectal cancer - from 2006; for all malignant neoplasms combined - from 2005, 2008 and 2013
  - (b) in upward trends during 2003-2015: for nervous system diseases – from 2008 and 2011. [Note: similar trend analyses of future data will explore any changes in the period post Transforming Health implementation]

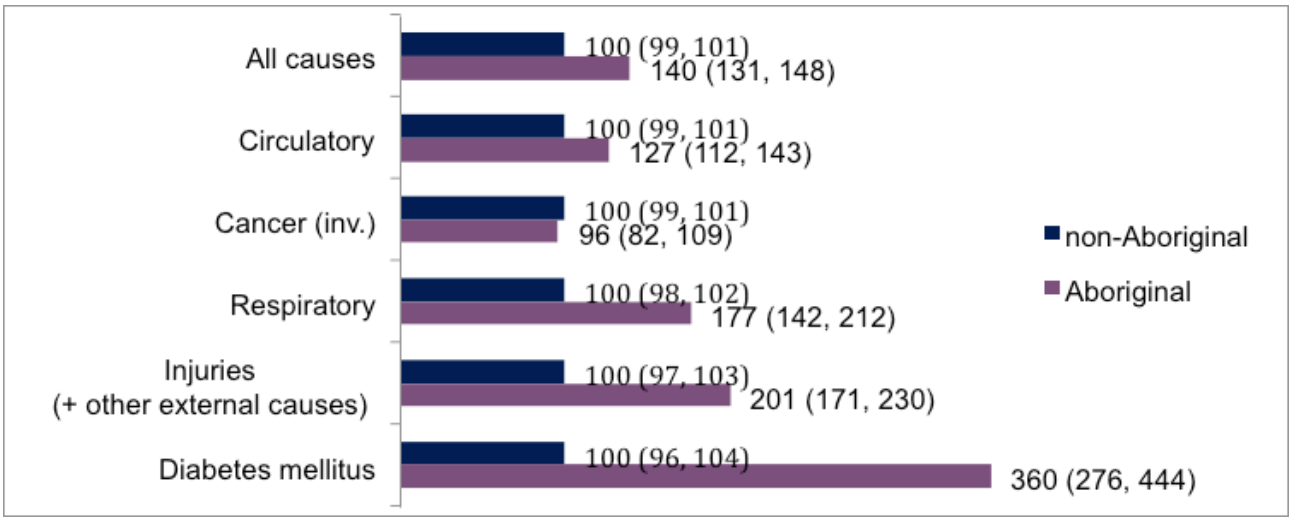
SA mortality differences by population sub-group (2009-2015)

By Aboriginal status

- The all-cause SMR was 40% higher in SA for Aboriginal than non-Aboriginal residents. (**Figure 10**)
- Disease categories contributing to this elevation in Aboriginal people included: diabetes mellitus (260% higher); endocrine, nutritional and metabolic diseases more generally (193% higher); infectious and parasitic diseases (144% higher); digestive system diseases (118% higher); genitourinary system diseases (103% higher); injuries, poisoning and other consequences of external causes (101% higher); symptoms, signs and other abnormal findings not recorded elsewhere (90% higher); diseases of the respiratory system (77% higher); ischaemic heart disease (32% higher); and circulatory system diseases in general (27% higher).
- There were also conditions with lower SMRs in SA Aboriginal than non-Aboriginal residents. Notable among these were several cancers, including colorectal cancer where very few deaths occurred in 2009-2015, leading to a 90% lower SMR in Aboriginal than other SA residents.

Figure 10: SA annual all-cause age-standardized mortality rate (95% CL) (Aust. 2011); 2009-2015, Aboriginal compared with non-Aboriginal people*

– Non-Aboriginal rate set to "100" –

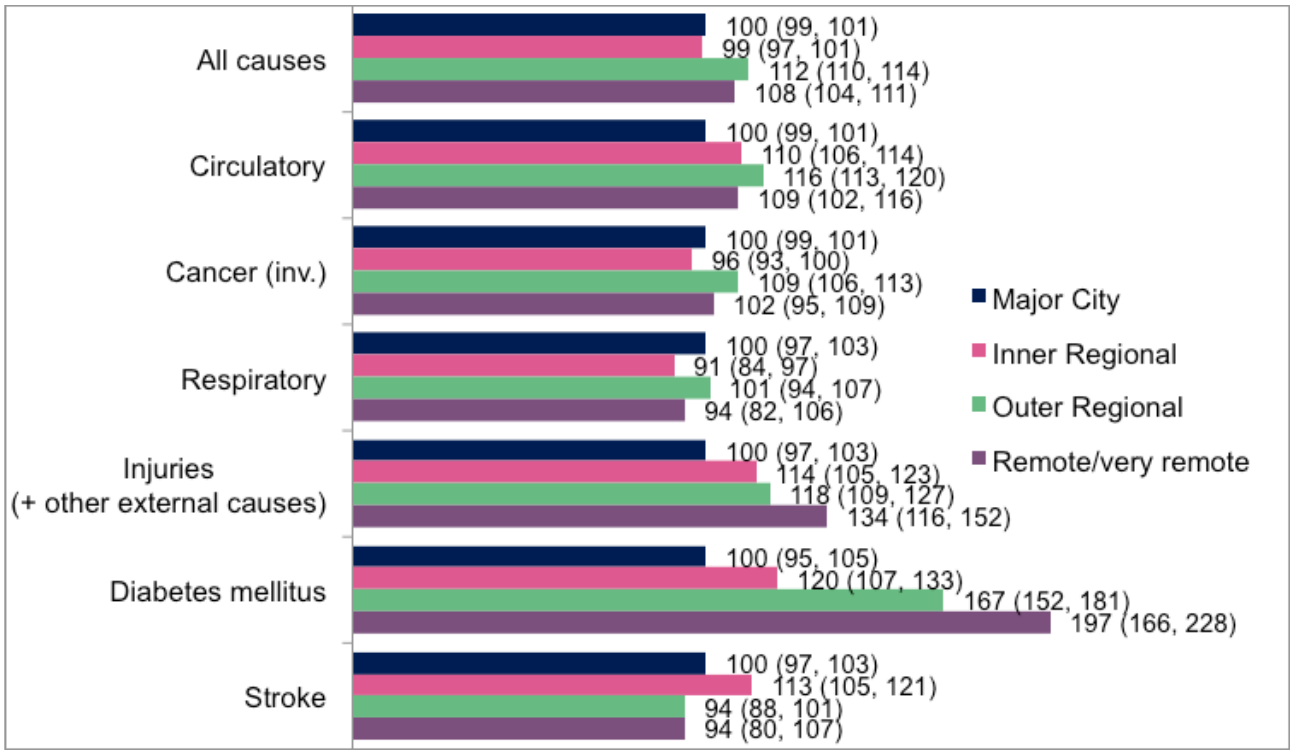


SA by remoteness of residential area

- Using major city as the reference category, all-cause SMRs were higher for outer regional (12% higher) and remote and very remote areas (8% higher) during 2009-2015. (**Figure 11**)

Figure 11: SA annual age-standardized mortality rate (95% CL) (Aust. 2011); 2009-2015, comparisons by remoteness of residential area*

– Major city areas rate set to "100" –



- Disease categories contributing higher SMRs outside major city areas included symptoms, signs and other abnormal findings not recorded elsewhere (54% higher in outer regional and 67% higher in remote and very remote), diabetes mellitus (20% higher in inner regional, 67% higher in outer regional, and 97% higher in remote and very remote), endocrine, nutritional and metabolic diseases more generally (44% higher in outer regional and 54% higher in remote and very remote), infectious and parasitic diseases (18% higher in outer regional and 42% higher in remote and very remote), injuries, poisoning and other consequences of external causes (14% higher in inner regional, 18% higher in outer regional, and 34% higher in remote and very remote areas), ischaemic heart disease (16% higher in outer regional), stroke (13% higher in inner regional), musculoskeletal and connective tissue (56% higher in outer regional), digestive system diseases (17% higher in outer regional), circulatory system diseases in general (10% higher in inner regional, 16% higher in outer regional and 9% higher in remote and very remote areas), and malignant neoplasms (9% higher in outer regional).
- There were also disease categories with lower SMRs outside major city areas. They included nervous system diseases (18% lower in inner regional), mental health and behavioural disorders (15% lower in inner regional), and respiratory diseases (9% lower in inner regional areas).

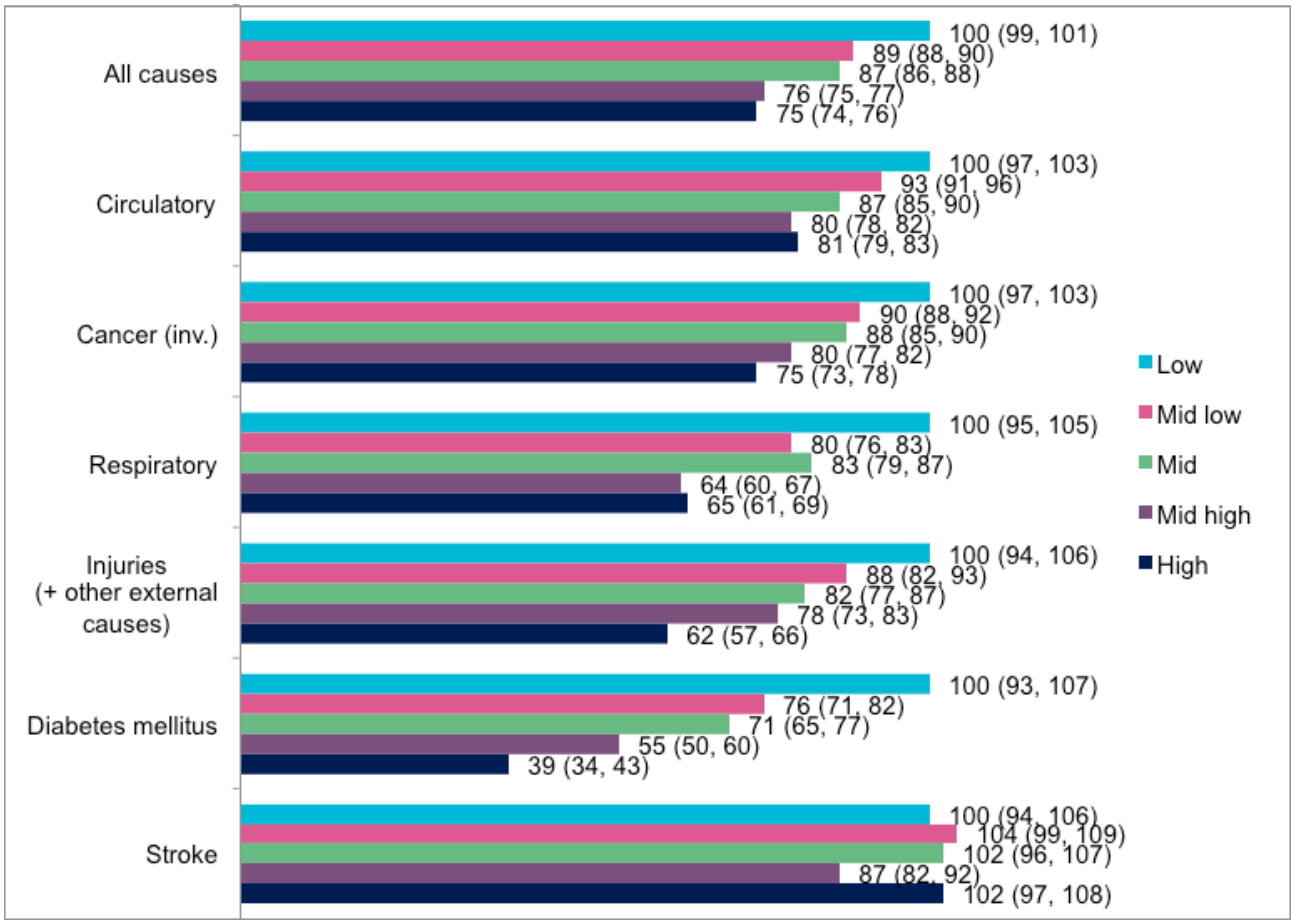
Note: corresponding SMRs for Australia overall in 2010-2014 showed similar differences. Compared with major city areas, the very remote category had an all-cause SMR about 48% higher. Disease contributing to higher SMRs in very remote areas included diabetes mellitus (+279%), suicide (125% higher), chronic obstructive pulmonary disease (112% higher), kidney failure (107% higher), heart failure and ill-defined heart disease (89% higher), coronary heart disease (64% higher), lung cancer (48% higher), and prostate cancer (44% higher). By comparison, some SMRs tended to be lower in very remote than major city areas. They included Alzheimer's disease (28% lower) and colorectal cancer (28% lower)

SA by socioeconomic status (SES) of residential area

- SA residents of the lowest socioeconomic areas had the highest all-cause standardized mortality rate (2009-2015). As a result, the mortality rate was 25% lower for the highest than lowest socioeconomic quintile, largely due to lower rates for: circulatory diseases; cancer; respiratory diseases; injuries, poisonings and other deaths from external causes; and diabetes mellitus (**Figure 12**).

Figure 12: SA annual age-standardized mortality (95% CL) (Aust. 2011); 2009-2015, comparisons by socioeconomic status of residential area*

– Low SES status set to "100" –



- All-cause SMRs were higher in lower SES areas. Compared with the highest SES quintile as the reference category, SMRs increased across quintiles, reaching a maximum for the lowest SES quintile at 34% higher.
- Disease categories contributing to higher SMRs in the lowest compared with highest SES reference quintile included: asthma (191% higher), circulatory system diseases in general (133% higher), symptoms, signs and other abnormal findings not recorded elsewhere (119% higher), endocrine, nutritional and metabolic diseases in general (118% higher), diabetes mellitus (156% higher), digestive system disorders (78% higher), diseases of blood, blood-forming organs and immune mechanisms (72% higher), infectious and parasitic diseases (66% higher), musculoskeletal and connective tissue disorders (64% higher), injuries, poisonings and other consequences of external causes (62% higher), diseases of the respiratory system (54% higher), malignant neoplasms (33% higher), ischaemic heart disease (33% higher), and colorectal cancer (20% higher).
- No substantial reverse trends were observed.

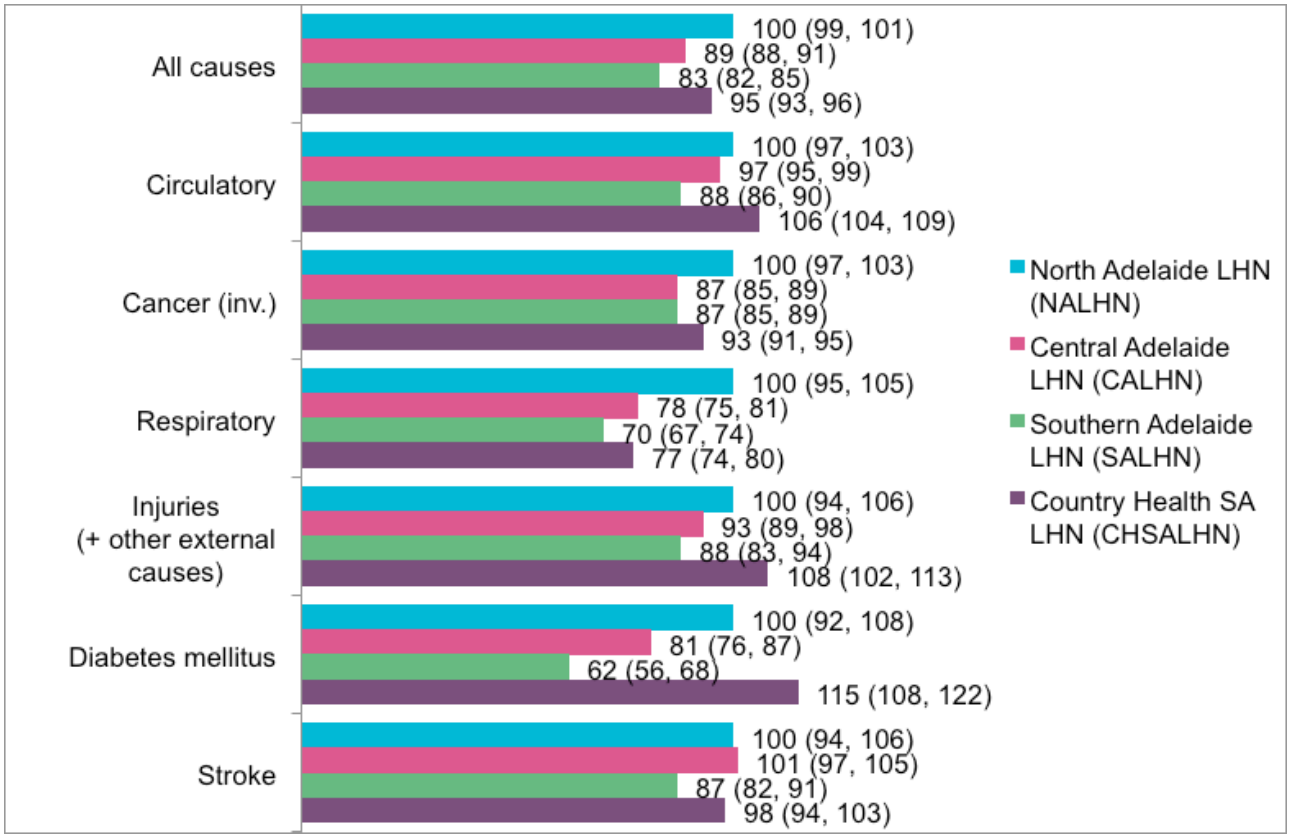
Note: corresponding SMRs for Australia overall in 2010-2014 showed similar differences. Compared with the highest SES quintile, all-cause SMRs increased across quintiles, reaching a maximum of 40% higher for the lowest SES quintile. Disease contributing to higher SMRs in the lowest than highest SES quintile included: diabetes mellitus (113% higher), chronic obstructive pulmonary disease (104% higher), lung cancer (76% higher), hypertensive disease (53% higher), heart failure and ill-defined heart disease (40% higher), suicide (36% higher), kidney failure (35% higher), colorectal cancer (25% higher), prostate cancer (21% higher), influenza and pneumonia (21% higher), pancreatic cancer (21% higher), and stroke (19% higher)

SA by Local Health Network of residential area

- Residents of the Northern Adelaide LHN (NALHN) had a higher all-cause SMR than residents of other South Australians LHNs (2009-2015) (between 5% to 17% higher), largely due to higher rates for: circulatory diseases (compared with Southern Adelaide LHN (SALHN)); cancer; respiratory diseases; potentially injuries, poisonings and other deaths from external causes (compared with SALHN); diabetes mellitus (compared with SALHN and Central Adelaide LHN (CALHN)); and stroke (compared with SALHN) (**Figure 13**).
- 2010-2014 data show disease categories contributing to higher SMRs in the NALHN compared with SALHN included: diabetes mellitus (61% higher), endocrine, nutritional and metabolic diseases generally (44% higher), respiratory system diseases (43% higher), infectious and parasitic diseases (41% higher), diseases of the nervous system (40% higher), diseases of the digestive system (29% higher), mental and behavioural disorders (23% higher), genitourinary system diseases (23% higher), stroke (15% higher), malignant neoplasms (15% higher), injuries, poisonings and other consequences of external causes (13% higher), diseases of the circulatory system in general (14% higher), and ischaemic heart disease (9% higher).
- No substantial offsetting reverse trends were observed.

Figure 13: SA annual age-standardized mortality rate (95% CL) (Aust. 2011); 2009 - 2015, comparisons by Local Health Network of residential area*

– Northern Adelaide LHN rate set to “100” –

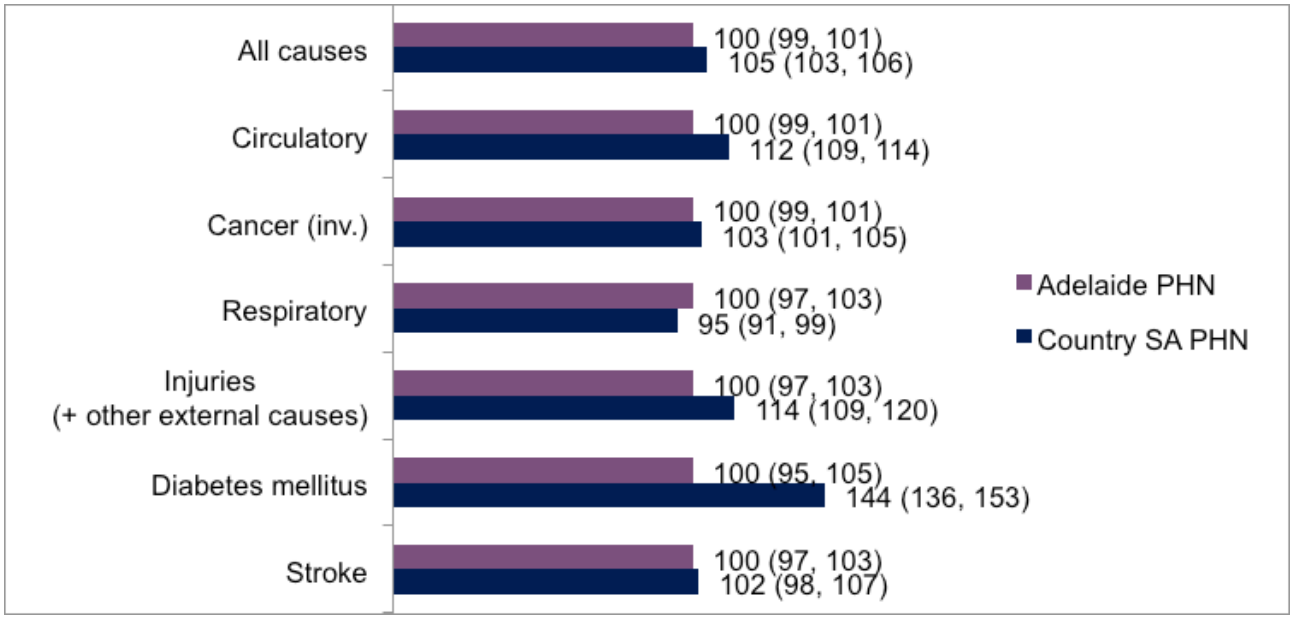


SA by Primary Health Network of residential area

- SA residents of Country Health SA PHN had a higher all-cause standardized mortality rate (about 5% higher) than for Adelaide PHN, largely due to higher rates for: circulatory diseases; potentially cancer; injuries, poisonings and other deaths from external causes; and diabetes mellitus (**Figure 14**).

Figure 14: SA annual age-standardized mortality rate (95% CL) (Aust. 2011); 2009-2015, comparisons by Primary Health Network of residential area*

– Adelaide PHN rate set to "100" –



*Figures 1-14 - Data Source: Australian Bureau of Statistics (ABS)

- Disease categories contributing to the higher SMR for the Country SA PHN included diabetes mellitus (44% higher), endocrine, nutritional and metabolic diseases more generally (24% higher), symptoms, signs and other abnormal findings not recorded elsewhere (30% higher), injuries, poisonings and other effects of external causes (14% higher), diseases of the circulatory system in general (12% higher), and ischaemic heart disease (9% higher).
- By comparison, diseases less common in the Country SA PHN included infectious and parasitic diseases (28% lower) and nervous system disorders (12% lower).

4.2 Hospital admissions

SA compared with Australia overall (2015-2016)

- AIHW reports a slightly lower separation rate for SA than the national figure (5% lower), due partly to a lower figure than for Victoria (7% lower), Queensland (17% lower) and WA (7% lower). These data covered both public and private hospitals. The relative stay index for this period varied with the method of standardization due to differences in age weightings, such that it was 6% higher for SA than nationally using direct standardization, and equivalent to the national figure with indirect standardization which is more closely weighted to the SA profile by age.
- SA was reported by the AIHW to have a lower hospitalization rate (public and private combined) during 2015-2016 than Australia overall (5% lower). Just over half the SA hospitalizations (58%) occurred in public rather than private facilities, but the percentage in public hospitals varied widely from lows of 13% for corneal grafts and 20% for knee arthroscopies to highs of 94% for asthma, 88% for mental and behavioural disorders, 87% for stroke and 86% for diabetes mellitus.

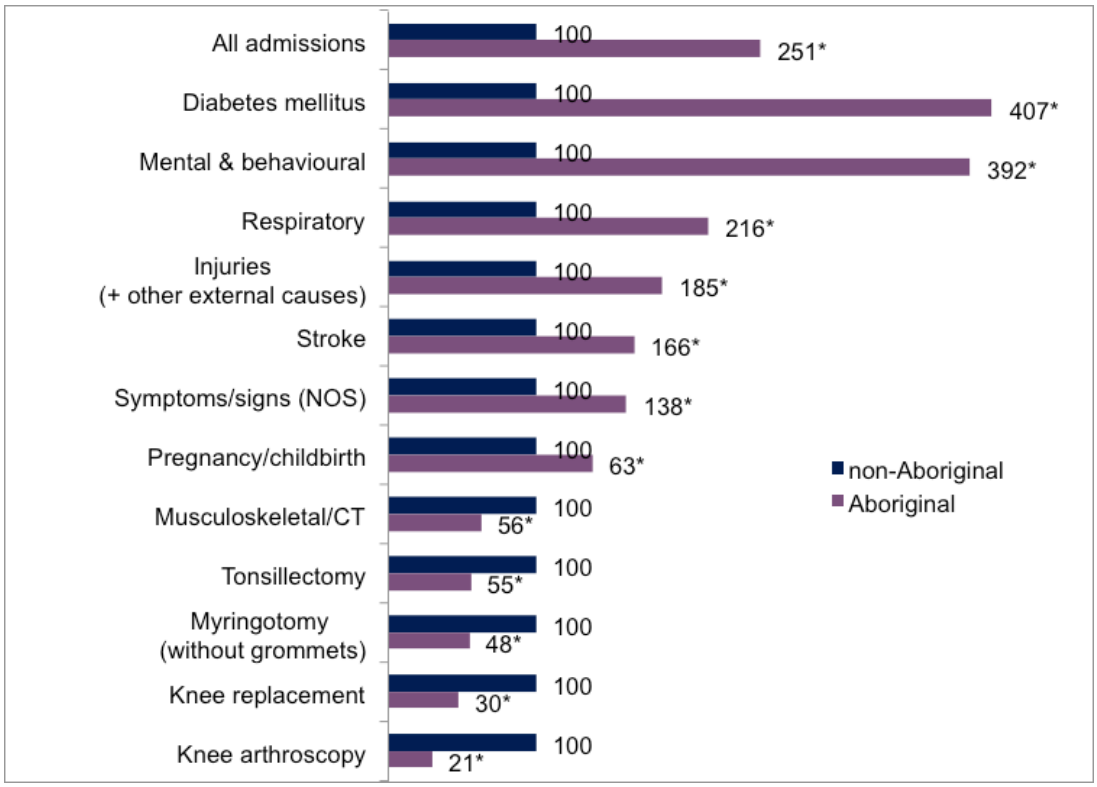
SA comparisons by population sub-group (2012-2016)

Aboriginal residents

- The age-standardized hospital admission rate (SHAR) was much higher for Aboriginal than non-Aboriginal people in SA (151% higher). Evidence of an elevated SHAR applied to many conditions but was strongest for diabetes mellitus (307% higher), mental and behavioural disorders (292% higher), respiratory system diseases (116% higher), injuries and other effects of external causes (85% higher), symptoms, signs and other abnormal findings not recorded elsewhere (61% higher), and pregnancy and childbirth (38% higher). (**Figure 15**)

Figure 15: SA annual age-standardized hospital admission rates (Aust. 2011); 2012-2016, Aboriginal compared with non-Aboriginal (*indicates where evidence for a difference is strongest)

– Non-Aboriginal rate set to "100" –



Data source: ISAAC

- By comparison, lower SHARs related to musculoskeletal and connective tissue disorders (44% lower) and for a range of procedures, knee arthroscopy (79% lower), knee replacement (70% lower), myringotomy (without grommets) (52% lower), and tonsillectomy (45% lower).

SA by remoteness of residential area

- Compared with the SHAR for major city areas, the SHAR was very similar for outer regional (2% higher), but lower for remote and very remote (16% lower) and inner regional areas (10% lower). (**Table 1**)

Table 1: SA annual age-standardized hospital admission rates (Aust. 2011); 2012-2016, comparison by remoteness of residential area (* indicates where evidence for a difference from major city area is strongest)

– Major city area rate set to "100" –

	Major city	Inner regional	Outer regional	Remote and very remote
All admissions	100	90*	102	84*
Non-invasive neoplasms	100	83*	65*	65*
Mental & behavioural	100	107	149*	113
Eye & adnexa	100	82*	79*	70*
Respiratory	100	101	123*	99
Digestive	100	96	100	80*
Skin & subcutaneous	100	72*	97	84
Pregnancy/childbirth	100	111	133*	119
Perinatal	100	68*	89	60
Congenital	100	104	87	84*
Injuries (+ other external causes)	100	115*	129*	125*
Cholecystectomy	100	100	115*	102
Hysterectomy/endometrial ablation	100	119*	118	104
Prostatectomy	100	110	79	72*
Tonsillectomy	100	111	121*	100
Knee replacement	100	119*	103	127*
Myringotomy (without grommets)	100	107	74*	71*
Corneal graft	100	80	71*	66*
Endometrial ablation	100	146*	125	107
Knee arthroscopy	100	113*	131*	106
Amputation of lower limb (diabetes)	100	60*	113	100

Data source: ISAAC

- The lower SHAR for remote and very remote compared with major city areas was affected by lower SHARs for non-invasive neoplasms (35% lower), conditions of the eye and adnexa (30% lower), diseases of the digestive system (20% lower), and congenital abnormalities (16% lower), and for a range of procedures, such as corneal grafts (34% lower), myringotomy (without grommets) (29% lower), and prostatectomy (28% lower). By comparison, remote and very remote areas had higher SHARs than major city areas for a range of conditions, including injuries, poisonings and other effects of external causes (25% higher), and a number of procedures, including knee replacements (27% higher).
- The lower SHAR for inner regional compared with major city areas was affected by lower SHARs for certain conditions originating in the perinatal period (32% lower), and conditions of the skin and sub-cutaneous tissue (28% lower), eye and adnexa (18% lower), and non-invasive neoplasms (17% lower). A lower SHAR also occurred for diabetes-related amputations of the lower limb (40% lower). By comparison, inner regional areas had higher SHARs than major city areas for injuries, poisonings and other effects of external causes (15% higher) and a number of procedures, including endometrial ablation (46% higher), hysterectomy and endometrial ablation (19% higher), knee replacement (19% higher) and knee arthroscopy (13% higher).

*SA by socioeconomic status (SES) of residential area (**Table 2**)*

- The lowest SES quintile had the highest SHAR. By comparison, SHARs were lower for the second quintile (5% lower), the third quintile (11% lower), the fourth quintile (7% lower), and the fifth (highest SES) quintile (10% lower).

Table 2: SA annual age-standardized hospital admission rates (Aust. 2011); 2012-2016, comparison by socioeconomic status of residential area

– Low SES rate set to "100" –

	Low SES	Mid low SES	Mid SES	Mid high SES	High SES
All admissions	100	95*	89*	93*	90*
Non-invasive neoplasms	100	130*	131*	155*	168*
Mental and behavioural	100	85*	81*	66*	60*
Respiratory	100	91*	81*	75*	69*
Musculoskeletal & CT	100	112*	106	117	117
Pregnancy/childbirth	100	91	77*	75*	70*
Diabetes mellitus	100	67*	61*	46*	35*
Skin cancer	100	128*	109	132	146
Cholecystectomy	100	88*	76*	72*	64*
Myringotomy (without grommets)	100	125*	127*	150*	164*
Corneal graft	100	148*	161*	209*	217*
Endometrial ablation	100	148*	130	148	130
Knee arthroscopy	100	122*	110*	123*	123*
Amputation of lower limb (diabetes)	100	74	52*	52*	35*
Surgery for fractured neck or femur	100	148*	95	98	105

Data source: ISAAC (* indicates where evidence for a difference from low SES is strongest)

- Conditions contributing to the 5% lower SHAR for the second quintile included diabetes mellitus (33% lower), mental and behavioural disorders (15% lower), and respiratory disorders (9% lower). Lower SHARs also applied for a range of procedures, such as cholecystectomy (12% lower). By comparison, the second quintile had higher SHARs than the lowest SES quintile for endometrial ablation (48% higher), surgery for fractured neck of femur (48% higher), corneal grafts (48% higher), myringotomy (without grommets) (25% higher), and knee arthroscopy (22% higher), and for diagnoses such as non-invasive neoplasms (30% higher), skin cancers (28% higher), and musculoskeletal and connective tissue conditions (12% higher).
- Conditions contributing to the 11% lower SHAR for the third quintile included diabetes mellitus (39% lower), pregnancy and childbirth (23% lower), respiratory conditions (19% lower), and mental and behavioural disorders (19% lower). The SHAR was also lower for diabetes-related amputations of the lower limb (48% lower) and cholecystectomy (24% lower). By comparison, the third quartile had higher SHARs than the lowest socioeconomic quintile for corneal grafts (61% higher), myringotomy (without grommets) (27% higher), and knee arthroscopies (10% higher), and for diagnoses such as non-invasive neoplasms (31% higher.
- Conditions contributing to the 7% lower SHAR for the 4th quintile included diabetes mellitus (54% lower), mental health and behavioural conditions (34% lower), diseases of the respiratory system (25% lower), and pregnancy and childbirth (25% lower), with a number of procedures also contributing, such as diabetes-related amputations of the lower limb (48% lower) and cholecystectomies (28% lower). By comparison, the 4th quintile had higher SHARs than the lowest socioeconomic quintile for non-invasive neoplasms (55% higher) and procedures such as corneal grafts (109% higher), myringotomy (without grommets) (50% higher), and knee arthroscopies (23% higher).
- Conditions contributing to the 10% lower SHAR for the 5th (highest SES) quintile included diabetes mellitus (65% lower), mental health and behavioural conditions (40% lower), diseases of the respiratory system (31% lower), and pregnancy and childbirth (30% lower), with contributions also from procedures such as diabetes-related amputations of the lower limb (65% lower) and cholecystectomies (36% lower). By comparison, the 5th quintile had higher SHARs than the lowest SES quintile for non-invasive neoplasms (68% higher), and procedures such as corneal grafts (117% higher), myringotomy (without grommets) (64% higher), and knee arthroscopies (23% higher).

SA by Local Health Network (LHN) of residential area (Table 3)

- Compared with the SHAR for the Northern Adelaide LHN (NALHN) as the reference, the SHAR for the Central Adelaide LHN (CALHN) was similar at 1% lower, and for the Country Health SA LHN (CHSALHN) at 3% lower. By comparison, the SHAR for the Southern Adelaide LHN (SALHN) was 10% higher.

Table 3: SA annual age-standardized hospital admission rates (Aust. 2011); 2012-2016, comparison by Local Health District of residential area

– NALHN set to "100" –

	NALHN	CALHN	SALHN	CHSALHN
All admissions	100	99	110*	97*
Cancer (invasive)	100	117*	131*	106
Non-invasive neoplasms	100	123*	129*	88
Mental & behavioural	100	111	111	131*
Respiratory	100	77*	94	98
Musculoskeletal & CT	100	97	126*	108
Genitourinary	100	90	100	87*
Pregnancy/childbirth	100	72*	89	106
Perinatal	100	88	101	72*
Symptoms/signs (NOS)	100	86*	101	97
Injuries (+ other external causes)	100	88	104	118*
Ischaemic heart disease	100	80	73*	99
Skin cancer	100	167*	214*	145*
Cholecystectomy	100	70*	83*	89*
Hysterectomy	100	88*	99	106
Hysterectomy/endometrial ablation	100	88*	95	109
Prostatectomy	100	123	145*	118
Tonsillectomy	100	95	104	115*
Hip replacement	100	98	105	115*
Knee replacement	100	79*	101	106
Myringotomy (without grommets)	100	105	125*	96
Arthroscopy	100	105	155*	118
Corneal graft	100	152*	124	97
Knee arthroscopy	100	104	127*	131*
Amputation of lower limb (diabetes)	100	82	76	76*

(Data Source: ISAAC) (* indicates where evidence of a difference from Northern Adelaide LHN is strongest)

- Conditions contributing to the higher SHAR for SALHN than NALHN included skin cancers (114% higher), cancer (invasive) overall (31% higher), non-invasive neoplasms (29% higher), and musculoskeletal and connective tissue disorders (26% higher). A range of procedures also contributed, including arthroscopies in general (55% higher), knee arthroscopies specifically (27% higher), prostatectomy (45% higher), and myringotomy (without grommets) (25% higher). By comparison, SALHN had a lower SHAR than NALHN for ischaemic heart disease (27% lower), and for a number of procedures, including cholecystectomy (17% lower).

4.3 Pregnancy outcomes, Caesarean sections, smoking during pregnancy and childhood immunization

SA compared with Australia

- Life expectancy at birth in SA, based on 2014-2016 data, was 80 years for males and 85 years for females, which was equivalent to corresponding national life expectancies for males and females respectively.
- The perinatal death rate per 1,000 births was 8.9 for SA in 2014, compared with 9.6 nationally. NSW and WA had lower rates of 7.7 and 8.6 per 1,000 respectively, but with 95% confidence ranges that were overlapping with the SA range.
- The infant mortality rate (deaths in the first 12 months of life) was similar in SA, WA, the ACT and Australia overall in 2016 at 3.1 per 1,000 livebirths. This was higher than the corresponding 2.7 per 1,000 for NSW and Victoria, but lower than the corresponding rates per 1,000 of 4.0 for Qld, 4.5 for Tas. and 6.9 for the NT. Nonetheless, only for the NT was there clearly a difference in rate from the SA figure (i.e., 95% confidence limits did not overlap).
- The low birthweight rate per 100 livebirths in SA in 2014 was 1.0 for births in the range under 1,500gm and 6.6 for births under 2,500gm, which was similar to the corresponding national rates of 1.0 and 6.4 per 100 live births respectively. Although lower rates were evident for WA and NSW, 95% confidence rages were overlapping with the SA range.
- The low Apgar rate (<7 at 5 minutes from birth) per 100 births was lower at 1.5 for SA than the corresponding 1.8 per 100 births nationally. Only WA and the ACT had comparably low rates to SA.
- The Caesarean section rate in SA in 2014 of 33.9 per 100 live births was similar to the national figure of 33.1 per 100. There was the indication of lower Caesarean section rates in NSW and Tasmania than SA, but not for other States and Territories where 95% confidence ranges overlapped with SA.
- Smoking during pregnancy was reported by 13% of SA mothers in 2014, which was a little higher than the corresponding national figure of 11% and corresponding smoking rates reported for the ACT, NSW, WA, and Victoria.
- Full immunisation status was achieved for 94% of SA children by five years of age, which was equivalent to the national figure. Only the ACT surpassed SA with a slightly higher immunisation coverage of 95%.

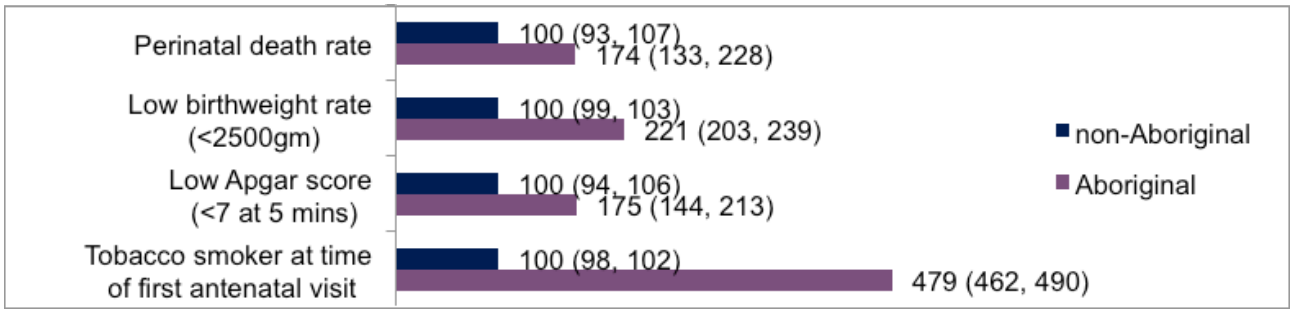
SA differences by population sub-group (2011-2015)

SA by Aboriginal status

- The perinatal death rate was 74% higher for births to Aboriginal than other mothers. Babies of Aboriginal mothers also had higher rates of low birthweight (250% higher for births<1500gm and 121% higher for births<2500gm) and a higher frequency of low Apgar scores (<7 at 5 minutes from birth) (75% higher). Aboriginal mothers were 379% more likely than other mothers to report at the time of their first antenatal visit that they were tobacco smokers. (**Figure 16**)

Figure 16: Birth outcomes and smoking prevalence during pregnancy (95% CL); 2011-2015, for Aboriginal compared with non-Aboriginal mothers

– Non-Aboriginal outcomes set to “100” –



SA by remoteness of residential area

- Generally, significant differences were not observed in perinatal death rates by remoteness of residential area. There was the indication that low birthweights were less frequent for inner regional and remote than major city areas but were more frequent for very remote areas. Caesarean sections as the mode of delivery was also more common for remote areas. Tobacco smoking at the time of the first antenatal visit was more common where mothers resided outside a major city area and most common for very remote areas (146% more common than for major city areas). (**Figure 17**)

Figure 17: Birth outcomes and smoking prevalence during pregnancy (95% CL); 2011-2015, comparisons by remoteness of residential area

– Major city areas set to “100” –

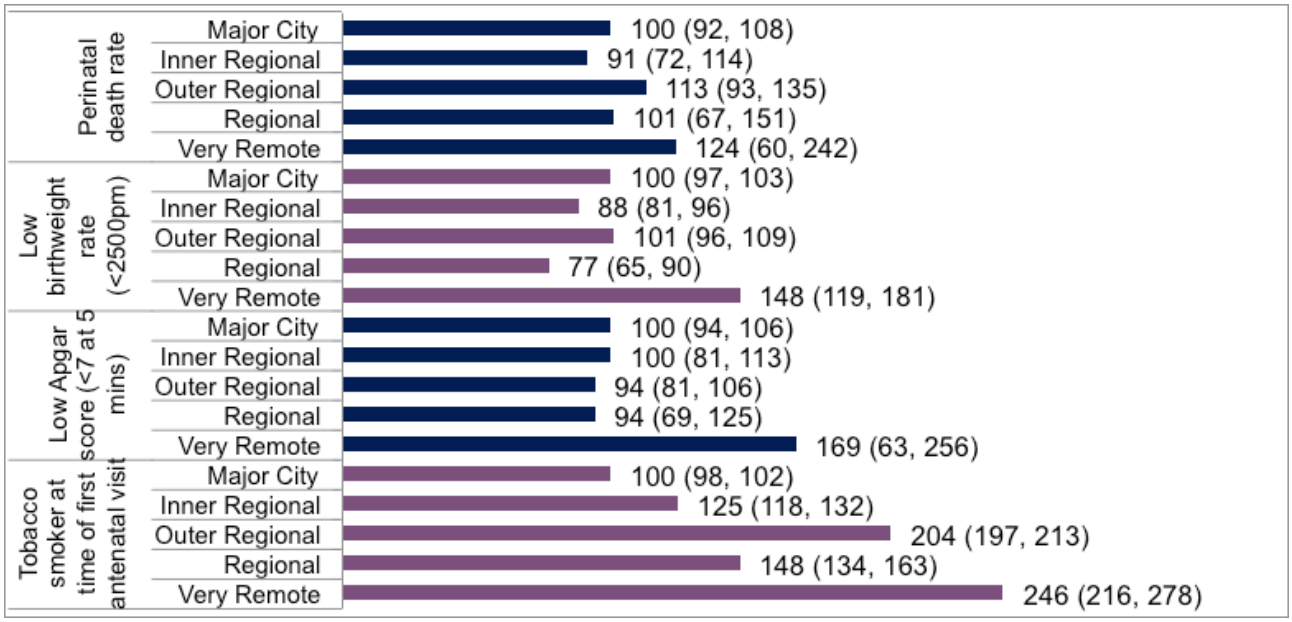
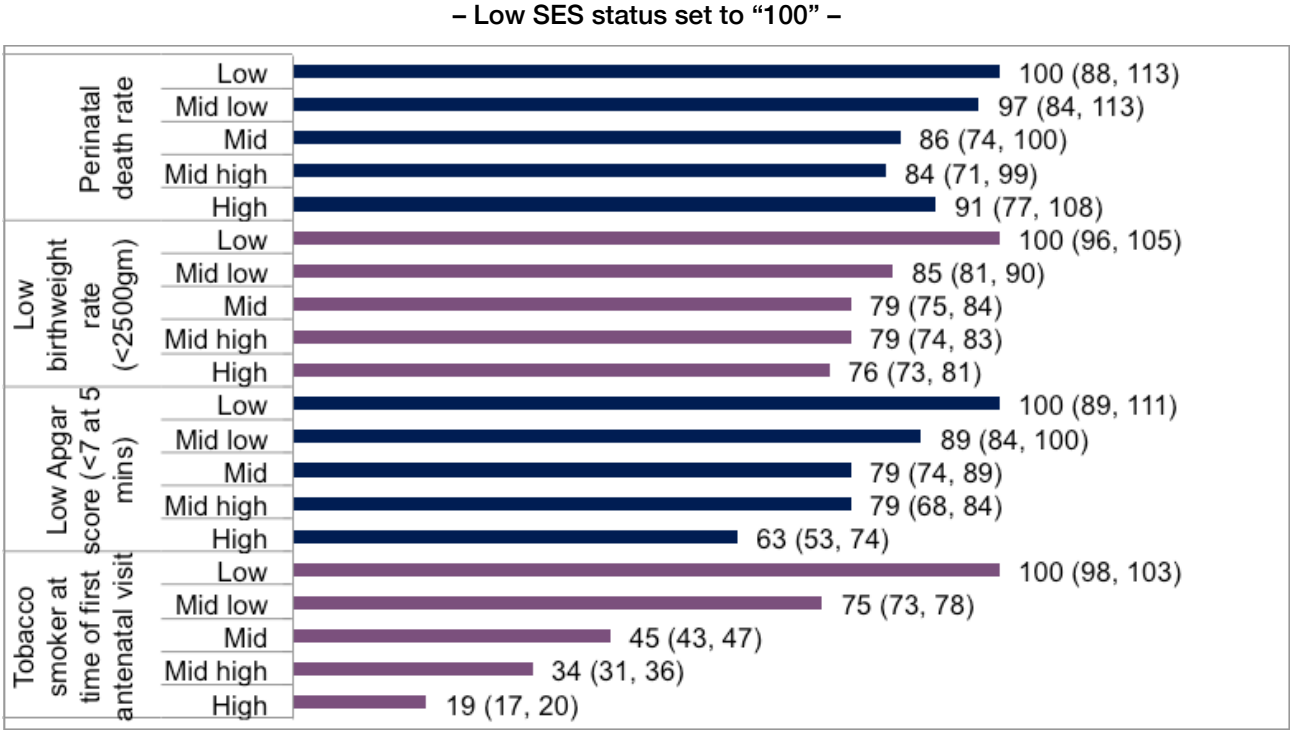


Figure 16 and 17 – Data source: SA Health, Prevention and Population Health Branch

SA by socioeconomic status (SES) of residential area

- Differences in perinatal death rates were suggested by SES of area but were within the range attributable to chance. The differences in low birthweight rates and low Apgar scores by SES were more pronounced, with the frequency of these outcomes tending to be lower in higher SES areas. Caesarean section rates were most commonly used in the lowest SES areas. Tobacco smoking at the time of the first delivery was more common in mothers from lower SES areas. (**Figure 18**)

Figure 18: Birth outcomes and smoking prevalence during pregnancy (95% CL); 2011-2015, comparisons by socioeconomic status of residential area



Data source: SA Health, Prevention and Population Health Branch

4.4 Cancer screening, vaccination and survival

Screening and vaccination

- Breast screening coverage of SA females in the 50-74-year target age range was 59% in 2014-2015. This compared with 54% for Australia overall and was the highest coverage of any State and Territory. During this same period, cervical screening coverage of SA females in the 20-69-year target age range was 59%, which was second only to Victoria and higher than the 57% for Australia overall. Bowel screening coverage of 50-74-year old people in SA at 46% was the highest of any State and Territory, exceeding the figure for Australia overall of 39%. Meanwhile 3-dose HPV vaccination was achieved for 74% of SA females turning 15 years of age in 2014, which was equivalent to the 74% for Australia overall and ranked equal fourth with Qld among Australia's eight States and Territories.

Cancer survival

- Five-year cancer survival figures for SA (2010-2014 data) were very similar to national figures reported by the AIHW. Using the recommended period method, eight comparisons covering all cancers collectively and common cancer types respectively produced either identical survival figures or figures within 1-2%. The data in **Table 4** point to differences across SA, however.

Table 4: Five-year period survival (95% CL), SA 2010-2014

	All cancers	Prostate cancer	Female breast cancer	Colorectal cancer	Lung Cancer	Skin (melanoma)
Diagnostic period:						
2010 – 2014	66 (66, 67)	95 (94, 96)	90 (89, 91)	68 (66, 69)	15 (13, 16)	89 (87, 90)
2005 – 2009	64 (63, 64)	91 (90, 92)	89 (87, 90)	65 (64, 67)	12 (11, 13)	90 (88, 91)
2000 – 2004	60 (60, 61)	87 (85, 88)	86 (85, 88)	61 (59, 62)	11 (10, 12)	93 (91, 94)
Sex:						
Male	66 (65, 67)	95 (94, 96)	-	67 (65, 69)	13 (12, 15)	85 (83, 88)
Female	67 (66, 67)	-	90 (89, 91)	68 (66, 70)	17 (15, 19)	93 (91, 95)
Aboriginal status:						
Non-aboriginal	66 (66, 67)	95 (94, 96)	90 (49, 88)	68 (66, 69)	14 (13, 16)	89 (87, 90)
Aboriginal	39 (33, 45)	79 (47, 98)	73 (89, 91)	58 (33, 77)	21 (11, 33)	-
SES status of area:						
1 (lowest)	60 (59, 61)	92 (89, 94)	88 (85, 90)	63 (59, 66)	14 (12, 16)	86 (82, 90)
2	64 (63, 65)	93 (91, 95)	89 (86, 91)	67 (63, 70)	14 (12, 17)	89 (85, 92)
3	66 (65, 67)	95 (93, 97)	89 (87, 91)	69 (66, 72)	13 (11, 16)	88 (84, 91)
4	70 (69, 71)	97 (95, 99)	92 (90, 94)	68 (64, 71)	16 (13, 19)	91 (87, 94)
5 (highest)	72 (71, 74)	99 (97, 101)	92 (90, 94)	72 (69, 76)	17 (14, 21)	89 (85, 92)
Remoteness of area:						
Major city	66 (66, 67)	96 (95, 97)	90 (89, 91)	68 (66, 70)	14 (12, 15)	88 (86, 90)
Inner regional	68 (67, 70)	94 (91, 97)	89 (85, 91)	69 (64, 73)	18 (14, 23)	90 (85, 94)
Outer regional	65 (64, 66)	94 (92, 97)	90 (87, 93)	65 (61, 68)	17 (14, 20)	88 (84, 92)
More remote	66 (64, 69)	94 (89, 98)	93 (86, 98)	65 (57, 72)	12 (7, 18)	92 (84, 98)

Data source: SA Health, Prevention and Population Health Branch

SA survival by diagnostic year

- Five-year period survivals increased from 60% for 2000-2004 diagnoses to 66% for 2010-2014. The corresponding increases by primary site of cancer was from 87% to 95% for prostate cancer; 86% to 90% for female breast cancer; 61% to 68% for colorectal cancer; 11% to 15% for lung cancer; and 3% to 7% for pancreatic cancer. The difference in survival between 2000-2004 and 2010-2014 was within the range attributable to chance for cancer of the cervix, although tending to increase. By comparison, a decrease in survival was indicated for skin cancer (melanoma) which ran counter to the general trend.

SA survival by sex

- Slightly higher survivals were suggested for females than males during 2000-2014, but the difference was marginal for all cancers combined at five years from diagnosis (67% compared with 66%) and attributable to random variation. A non-random difference was suggested, for skin (melanoma) (93% Vs 85%), and potentially lung (17% Vs 13%).

SA survival by Aboriginal status

- As observed nationally, survival was lower for Aboriginal than non-Aboriginal patients. An earlier CANDAD project (Cancer Data and Aboriginal Disparities), an NHMRC funded Partnership Grant, indicated a similar difference that was partly explained by an excess of cancer types with poor prognoses (e.g., certain head and neck, upper gastro intestinal and respiratory tract cancers), more advanced stages of progression of cancers at diagnosis, and higher levels of comorbidity (including diabetes mellitus, circulatory and respiratory system diseases). Aboriginal people with cancer are more likely to live in remote areas where access to treatment is more difficult. The potential for less complete care resulting from this and other factors is presently under investigation through the CANDAD project. Differences in survival by cancer type are difficult to interpret for 2010-2014 due to small numbers but survivals tended to be lower among Aboriginal patients for female breast cancer and potentially cancers of the prostate, colon/rectum, and cervix, whereas a reverse trend with a higher survival for lung cancer was suggested among Aboriginal people.

SA survival by remoteness of residential area

- In general, there was little difference in survival by remoteness for SA cancer patients. The five-year survival for 2010-2014 was 66% for all cancers combined for residents of major city areas, 68% for inner regional, 65% for outer regional and 66% for more remote. Similarly, little difference was suggested by area of residence for individual cancer types. (**Table 4**)

SA by socioeconomic status (SES) of residential area

- Lower survivals were suggested for lower SES areas. The highest SES quintile had a five-year survival of 72% compared with 60% for the lowest SES quintile. A similar pattern was suggested for cancers of the prostate (99% Vs 92%), colon/rectum (72% Vs 63%), and less so, female breast (92% Vs 88%). (**Table 4**)

4.5 Self-reported health status and health risk factors (ABS: National Health Survey, 2014-2015)

SA compared with Australia

- The age-standardized proportion (using the Australia 2001 reference population) of SA participants aged 15+ years reporting to be in good to excellent health was 85%, which was similar to the corresponding 86% for Australia overall. Among other States and Territories, the lowest percentage was 82% for Tasmania and the highest was 88% for WA. Four per cent of SA participants reported that their health status was poor, which was similar to the 4% for Australia overall. Among other States and Territories, the lowest percentage rating their health status as poor was 3% for WA and the highest was 6% for WA.
- While the proportions reporting specified conditions were very similar across States and Territories, SA tended to rank at the higher end of the prevalence scale for arthritis and back problems. Similarly, the proportions reporting specified lifestyle risk factors were very similar across States and Territories, although with SA tending to rank at the high prevalence end for little or no exercise, inadequate fruit intake, and exceeding alcohol consumption guidelines on single occasions. SA participants also tended more to report relatively high levels of psychological stress.
- By comparison, SA tended to be at the lower end of the smoking prevalence scale, with only the ACT reporting a lower smoking prevalence. SA participants were less likely to report consuming alcohol on five or more days per week over a 12-month period. They were also more likely to report daily vegetable consumption. (**Table 5**)

Table 5: Comparison of self-reported health conditions and lifestyle risk factors; National Health Survey, 2014-2015*

Characteristics	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Aust.
Present conditions:									
Arthritis	14.7	13.7	12.4	15.2	12.3	19.3	10.2	13.6	13.9
Asthma	10.3	11.9	10.5	10.6	9.6	12.8	8.7	11.8	10.8
Back problems (dorsopathies)	15.4	15.4	16.1	17.0	15.6	16.8	14.1	15.9	15.6
Blindness (complete and partial)	0.5	0.6	0.4	0.3	0.5	0.9	0.4	0.3	0.5
Cancer (malignant neoplasms)	1.5	1.2	1.9	1.6	1.1	1.0	0.9	1.8	1.5
Chronic obstructive pulmonary disease (COPD)	2.7	2.3	2.6	2.5	2.0	3.0	2.4	2.2	2.4
Deafness	9.8	10.4	11.7	10.3	9.4	11.6	12.8	10.6	10.4
Diabetes mellitus	4.9	4.7	4.3	4.6	4.6	4.2	5.1	4.3	4.7
Hayfever and allergic rhinitis	18.6	21.2	16.8	21.4	21.1	22.8	11.8	25.8	19.5
Heart, stroke and vascular disease	4.4	4.9	5.2	4.5	4.2	6.3	3.8	3.9	4.7
Hypertension	10.6	10.2	9.6	10.3	9.2	12.9	7.9	12.3	10.2
Kidney disease	0.8	0.9	0.7	0.8	0.8	1.3	1.0	1.3	0.8
Long sightedness	28.8	25.2	29.1	28.5	21.0	28.2	27.1	26.9	27.1
Mental and behavioural problems	17.7	17.3	18.0	18.1	14.5	21.0	15.3	18.2	17.4
Osteoporosis	3.6	3.0	2.8	3.1	2.7	3.0	1.6	4.0	3.1
Short sightedness	24.6	26.5	23.4	22.8	24.6	21.0	23.8	31.0	24.7
Lifestyle risk factors									
Severe/very severe bodily pain	9.0	8.7	7.3	8.0	6.9	9.9	8.4	7.8	8.3
High/very high psychological distress	11.1	12.5	12.0	13.6	9.9	14.0	8.1	11.0	11.8
Overweight	34.9	37.0	33.4	35.2	36.2	34.6	34.8	39.3	35.4
Obese	27.9	26.0	29.9	29.2	24.2	31.3	29.8	23.7	27.5
Current daily smoker	14.4	13.9	16.3	13.5	14.2	19.3	19.9	12.2	14.7
Alcohol intake (> lifetime risk guidelines)	17.6	15.6	17.8	16.7	20.5	19.1	18.7	15.8	17.3
Alcohol intake (> single occasion guidelines)	43.8	43.3	47.1	47.1	46.9	49.2	45.0	43.5	45.0
Inadequate fruit consumption	51.3	52.0	49.2	52.1	45.8	53.8	51.8	50.5	50.6
Inadequate vegetable consumption	94.0	93.7	92.0	93.2	91.2	88.6	91.7	94.8	93.0
No/Low exercise level	66.9	64.8	67.0	67.8	62.9	67.0	64.4	59.8	65.9
High blood pressure	21.3	22.8	22.5	22.6	20.4	25.2	21.5	23.7	22.1

*National household interview survey of Australian residents aged 15+ years; Data Source: ABS

SA differences by population sub-group

SA by remoteness of residential area

- Self-reported risk factors generally were similar by remoteness of residence, but differences presented: in having a smoking history, which was more common in outer regional and more remote areas; in short-term alcohol risk using 2001 guidelines (p=0.003), with outer regional and more remote areas reporting a higher prevalence of this risk (about 66-68% higher than for major city areas and inner regional areas); in adherence to recommended exercise guidelines (p=0.001), with major cities reporting less adherence about 21% less than inner regional and more remote areas); and for Body Mass index (BMI) (p<0.001), with major cities reporting a higher BMI (about 18-19%) higher than inner regional and more remote areas).

5. Summary of key points

5.1 Mortality (SA vs Australia overall):

SA is a typical of Australia in that:

- Life expectancy at birth in SA (2014-2016 data) equates with national figures of 80 years (males)/85 years (females)
- Overall age-standardized death rates (2003-2015) are similar, although SA rates are:
  - Higher for some causes – e.g., kidney failure, asthma, influenza and pneumonia, liver disease, suicide, mental and behavioural disorders, and Alzheimer's disease
  - Lower for other causes – e.g., cancers of the lung, prostate and skin (melanoma)
- Between 2003-2005 and 2015, a 12% reduction in age-standardized death rate occurred both for SA and Australia as a whole. Respective reductions were 45% and 43% for ischaemic heart disease, 38% and 32% for stroke, and 33% and 17% for genitourinary diseases. By comparison, increases applied to mental health and behavioural and nervous system disorders

5.2 Mortality Differences present within SA (2009-2015):

By Aboriginal status:

- Aboriginal residents have a 40% higher age-standardized death rate. Contributing conditions include: diabetes mellitus; circulatory system diseases (including ischaemic heart disease); injuries, poisonings and other consequences of external causes; infectious and parasitic diseases; and diseases of the respiratory and digestive systems

By remoteness of residence:

Compared with major city areas:

- Age-standardized death rates are 12% higher for outer regional and 8% higher for more remote areas. Conditions contributing to these differences include: diabetes mellitus; circulatory system diseases; injuries, poisonings and other consequences of external causes; and infectious and parasitic diseases

By socioeconomic status (SES) of residential area:

- The lowest SES quintile have a 34% higher age-standardized death rate than the highest SES quintile. Conditions contributing to this difference include: diabetes mellitus; circulatory system diseases; injuries, poisonings and other effects of external causes; respiratory conditions (including asthma); infectious and parasitic diseases; and cancers

By LHN of residence:

- Southern Adelaide LHN has the lowest age-standardized death rate, with a 7% higher rate for Central Adelaide LHN, a 13% higher rate for Country Health SA LHN, and a 20% higher rate for Northern Adelaide LHN. Conditions contributing to these variations include: diabetes mellitus; circulatory system diseases; injuries, poisonings and other effects of external causes; respiratory conditions; infectious and parasitic diseases; and cancers

By PHN of residence

- The age-standardized mortality rate is about 5% higher for Country SA PHN than Adelaide PHN
- Among conditions contributing to this difference are: diabetes mellitus; circulatory system diseases (including ischaemic heart disease and stroke); and injuries, poisonings and other consequences of external causes

5.3 Hospital admissions:

SA vs Australia overall (2015-2016):

- AIHW reports a slightly lower (5% lower) hospitalization rate for SA than Australia overall (public and private), and a similar relative stay index score based on indirect age standardization

Differences within SA (2009-2015):

By Aboriginal status:

- The Aboriginal population has a 151% higher age-standardized hospitalization rate. Contributing conditions include: diabetes mellitus; injuries, poisonings and other consequences of external causes; stroke; mentaland behavioural disorders; and respiratory conditions

By remoteness of residence compared with major city areas:

- Age-standardized hospitalization rates are 10% lower for inner regional and 16% lower for remote and very remote areas, with contributors to these differences including: non-invasive neoplasms and conditions of the eye and adnexa. Admissions for corneal grafts and potentially conditions arising in the perinatal period are less common for non-metropolitan residents. By comparison, non-metropolitan areas have a higher hospitalization rate for injuries, poisonings and other consequences of external causes

By socioeconomic status of residential area:

- The lowest SES quintile has a 10% higher age-standardized hospitalization rate than the highest SES quintile, due partly to higher rates for: diabetes mellitus; mental and behavioural disorders; respiratory conditions; and pregnancy and childbirth; and for cholecystectomies and amputations of the lower limb (diabetes related)

By LHN of residence:

- Compared with Northern Adelaide LHN, the age-standardized hospitalization rate is similar for Central Adelaide LHN and Country Health SA LHN, but about 10% higher for the Southern Adelaide LHN due partly to higher hospitalization rates for invasive cancers (including skin cancers), non-invasive neoplasms, and musculoskeletal and connective tissue disorders. Admissions for procedures that are more common in Southern Adelaide residents include: prostatectomies; myringotomies (without grommets), and arthroscopes (including knee arthroscopies)

5.4 Pregnancy outcomes:

- The perinatal death rate per 1,000 livebirths was 8.9 for SA in 2014, compared with 9.6 nationally. SA and national rates were broadly equivalent for low birthweight, low Apgar scores, and infant mortality. Caesarean section rates also were similar. Smoking prevalence at time of first antenatal visit was 13% for SA and 11% nationally
- By five years of age, 94% of SA children are fully immunized (2014 data), which is similar to the national figure
- SA data (2011-2015) indicate:
  - A 74% higher perinatal death rate for births to Aboriginal than non-Aboriginal mothers
  - Higher frequencies of low birthweights and low Apgar scores for births to Aboriginal mothers
  - Aboriginal mothers to have an almost four-times the tobacco smoking prevalence of other mothers at the time of the first antenatal visit
  - Births to mothers from very remote areas to have a higher frequency of low birthweights, and these mothers to have higher caesarean section rates and a higher tobacco smoking prevalence
  - Births to mothers from lower socioeconomic areas to have a higher frequency of low birthweight and to be less likely to be delivered by caesarean section. These mothers have a higher tobacco smoking prevalence.

5.5 Cancer screening, vaccination and survival:

- Breast, cervical and bowel screening coverage tend to be higher for SA than Australia overall (2014-2015 data) whereas 3-dose HPV vaccination of females turning 15 years of age in 2014 was equivalent for SA and Australia
- Only broad cancer survival comparisons are possible using 2010-2014 data, due to methodological differences (e.g., differences in completeness of follow-up of deaths through the National Death Index). SA had a more complete follow-up during this period, which would have led to lower recorded survival
- Five-year cancer survival figures for SA (2010-2014 data) were very similar to national figures reported by the AIHW. Using the recommended period method, eight comparisons covering all cancers collectively and common cancer types respectively produced either identical survival figures or figures within a 1-2% range. The data indicated the following differences within SA in more detailed analyses:
  - For all cancers combined (excluding non-melanoma skin cancers): an increased survival since 2000-2004; a substantially higher survival for non-Aboriginal than Aboriginal people with cancer; and a higher survival of patients from higher SES residential areas (measured in quintiles)
  - For prostate cancer: an increased survival since 2000-2004; a higher survival of patients from higher SES areas
  - For female breast cancer: an increased survival since 2000-2004; a substantially higher survival for non-Aboriginal than Aboriginal patients; and potentially, a higher survival of patients from higher SES areas
  - For colon/rectum cancer: an increased survival since 2000-2004; and a higher survival of patients from the highest than lowest SES areas
  - For lung cancer: an increased survival since 2000-2004; and potentially a higher survival for females
  - For pancreatic cancers: an increased survival since 2000-2004
  - For skin cancer (melanoma), a higher survival for females than males. Notably a decline in 5-year survival was observed between from 2000-2004 and 2010-2014 (from 93% to 89%) which was contrary to general trends
  - No differences in survival were observed for cervical cancer by diagnostic period since 2000-2004 or sociodemographic characteristics other than were readily attributable to chance

5.6 Self-reported health status and risk factors (ABS: National Health Survey, 2014-2015):

- The age-standardized proportion of SA participants aged 15+ years reporting good to excellent health was 85%, similar to the 86% for Australia overall. Four per cent of SA participants reported a poor health status, as reported nationally
- The range of reported prevalence of specified conditions was very narrow across States and Territories, with SA tending to rank at the higher end the scale for arthritis and back problems
- The range reporting specified lifestyle risk factors was also very narrow, with SA tending to rank at the higher prevalence end for little or no exercise, and inadequate fruit intake, but also for daily vegetable consumption. While SA tended more to report exceeding alcohol consumption guidelines for single occasions, they were less likely to report consuming alcohol on five or more days per week over a 12-month period and to be smokers. SA participants tended more to report relatively high levels of psychological stress
- Self-reported risk-factor prevalence in SA generally was similar by remoteness of residence, but differences presented: for short-term alcohol risk using 2001 guidelines, with outer regional and more remote areas reporting a higher prevalence; for having a smoking history, which was more common in outer regional and more remote areas; for recommended exercise guidelines, with major cities reporting less adherence to recommended guidelines; and for Body Mass Index (BMI), with major cities reporting a higher BMI on average than inner regional and more remote areas.

6. Conclusions

While SA generally has very similar life expectancies at birth, and similar mortality and hospitalization rates, pregnancy outcomes, and cancer survival outcomes to Australia as a whole, and has experienced equivalent reductions over time in age-standardized death rates from all causes of death combined, there are disparities within SA by remoteness of residence, socio-economic status, and Aboriginal status.

Each disparity warrants individual interpretation and decision-making as to likely causes and amenability to remedial action. In that context, the data provide a “road map” to consider in action plans.

In general, South Australians report a similar overall status of health to Australians overall, but there are individual areas of potential disparity. Areas warranting attention in the primary-prevention domain include lack of exercise and raised BMI (especially in the metropolitan area), inadequate fruit intake, and in outer regional and more remote areas in particular, elevated tobacco smoking rates and excesses in single-episode alcohol consumption.

Too little follow-up time has elapsed since the introduction of the Transforming Health initiative in early 2015 to use these statistics to identify subsequent change, but these data do provide benchmarks that will be useful comparators in later evaluations. The same data sources should be used to facilitate these comparisons, although more focused development of additional metrics may be taken for health areas that are selected for special attention.

In general, further and more detailed analyses are required to determine causes and facilitate service targeting.

10.3.2 The Patient Centred Experience

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1. Executive Summary

There is evidence that a patient centred focus can lead to improvements in health care quality and outcomes. Patient centred care is also recognised as being integral to the delivery of effective models of care.

Given the limitations of scope, when considering how to investigate aspects of Transforming Health for the patient centred experience, it was resolved to investigate, with consumers, the following hypothesis:

'The experience of patients receiving healthcare through Transforming Health is one that is patient centred.'

A mixed methods approach was used for the evaluation, with quantitative data about the patient centred experience in 2016 being accessed from the SA Health South Australian Consumer Experience Surveillance System (SACESS) Survey.

Qualitative data were generated from Focus Groups and an interview conducted across four Transforming Health models of care (Acute Coronary Syndrome, Orthogeriatric - Acute Hip Fracture Management, Rehabilitation Services and Stroke). These models of care had been implemented for a reasonable time, in two hospitals, of two Local Health Networks.

There were 271 letters sent to patients/carers/families inviting them to participate in the evaluation and responses were received from 19 people (response rate = 7%). A thematic analysis of Focus Group and interview transcripts was conducted to find which areas of health care patients and carers commented on most frequently, and this included both positive and negative comments. These comments were categorised using a documented framework on patient centred care.

There was essentially an even spread of negative (52%) and positive (48%) responses with the highest number of positive responses in the categories of The Therapeutic Environment, and Information and Communication and Education. The categories with the largest number of negative responses were related to Transition and Continuity of Care, and Respect for Patients' Expressed Needs.

Results from the 2016 SACESS Survey were in general agreement with information from the Focus Groups except with regard to Respect for Patients' Expressed Needs. The indicator for the Survey scored well above the State benchmark, whereas there were a high number of both positive and negative comments from Focus Group participants in the corresponding category.

It was evident that while patients could be treated under the same model of care and in the same therapeutic environment, they could have very different care experiences sometimes very positive and sometimes very negative. This suggests there is opportunity to explore and improve consistency of care processes within models of care and particularly in the areas of:

- transfers between hospitals
- discharge from hospital
- open communication between staff and patients/carers so that knowledge and information flows freely
- the process of informing patients and carers of their rights and ways to provide feedback.

The patient experiences reported here can only be associated with the four models of care investigated rather than attributed to them, as there would have been many other factors contributing to patient care at that time.

2. Introduction

The “Transforming Health Delivery – Our Next Steps” document (Minister for Health, 2015) stated that all decisions about Transforming Health (TH) would be underpinned by the 284 Clinical Standards of Care and the following six quality principles:

- Patient centred
- Safe
- Effective
- Accessible
- Efficient
- Equitable.

There is evidence that a patient centred focus can lead to improvements in health care quality and outcomes by increasing safety, cost effectiveness and patient, family and staff satisfaction (Australian Commission on Safety and Quality in Health Care 2011). There is also evidence that consumer and community engagement offers a promising pathway toward better quality health care, more efficient health care and service provision, and improved population health (Gregory, 2008).

To review the experience of patients who have spent time in a country or city public hospital, SA Health uses the South Australian Consumer Experience Surveillance System (SACESS) to survey consumers on all aspects of their experience. However, the data that the SACESS Survey provides about indicators for the patient centred experience are not associated with particular Transforming Health activities, and therefore further investigation of patient centred experiences associated with TH activity was required.

In this evaluation, Focus Groups were held to investigate the perceptions of patients and carers about their experiences in four models of care introduced under Transforming Health. These perceptions were compared with results from the 2016 SA Health SACESS Survey for indicators relevant to patient centred care.

Patient centred care is recognised as being “the core of new and effective models of care delivery” (Kitson, Marshall, Bassett, & Zeitz, 2013, p. 5) and the common three themes have been defined as patient participation and involvement, the relationship between the patient and the healthcare professional, and the context where care is delivered (Kitson et al., 2013). Analysed Focus Group information was categorised into these themes.

The scope of the evaluation was limited by the lack of availability of pre implementation data associated with implementing Transforming Health models of care, related to patient centred experience.

3. Evaluation Hypothesis/ Questions

The hypothesis for investigating this theme was:

The experience of patients receiving healthcare through Transforming Health is one that is patient centred.

The key questions for investigating this theme were:

1. On reflection, how do patients perceive they have been involved in decision making and engaged in their care?
2. To what extent have patients been treated with respect and dignity, and been informed about patient rights and ways to provide feedback?
3. What are patients' perceptions of their experience upon discharge from hospital?

4. Methods

4.1 Conducting the Focus Groups

The research team consisted of three researchers representing the Health Consumers Alliance of SA Inc., Adelaide Primary Health Network, and SA Health.

A qualitative approach was used and Focus Groups were conducted to generate primary data from patients and carers about their experiences. Secondary data was obtained from the 2016 SACESS Survey.

Consultations to discuss the evaluation and inform stakeholders were held with:

- SA Health Executive Director, Quality, Information and Performance
- The TH Consumer and Community Engagement Committee
- The Chief Executives of the Central and Northern Adelaide Local Health Networks (CALHN and NALHN), and the NALHN Executive Group.

The following approvals were received for the Evaluation:

- Ethics approval from the SA Department for Health and Ageing Human Research Ethics Committee (HREC)
- Site Specific Approvals from SA Health Research Governance Officers in the Central and CALHN and NALHN, and the SA Department for Health and Ageing.

The investigation was limited to the following four models of care that had been implemented for a sufficient period of time to have generated at least short term outcomes:

- Acute Coronary Syndrome (ACS) Emergency Department Pathway
- Stroke Model of Care
- Rehabilitation Services
- Orthogeriatric-Acute Hip Fracture Model of Care.

Time and budget also limited investigations of the patient centred experience in those four models of care, to CALHN and NALHN.

SA Health Data and Reporting Services assisted with recruitment of participants in CALHN and NALHN

through their database used for Computer Assisted Telephone Interviews. Letters were sent to 271 patients/carers/families who had experienced care under the selected models of care from 1 July - 31 August 2017. In NALHN, support was also provided by the Consumer Advisory Committee via distribution of recruitment flyers.

Recruitment of patients receiving care from 1 July - 31 August 2017 ensured that discussions with patients from the Royal Adelaide Hospital were centred on care provided before the move to the new Royal Adelaide Hospital in early September.

A Moderator Guide for conducting the Focus Groups was developed by the researchers to reflect a semi-structured format. It was reviewed by members of the TH Consumer and Community Engagement Committee. Their feedback was incorporated into the Moderator Guide, including the suggestion to use the following three “Traffic Light Questions” to guide participants in reflecting on answers to the questions:

“What did you notice that you’d like them to START doing?”

“What did you notice that you’d like them to KEEP doing?”

“What did you notice that you’d like them to STOP doing?”

One Focus Group was held at Health Consumers Alliance of SA Inc to explore patient/carer perceptions of the Acute Coronary Syndrome model of care at the Royal Adelaide Hospital. Two Focus Groups were held at the Modbury Hospital to explore patient/carer experiences of the following models of care: Orthogeriatric - Acute Hip Fracture Management, Rehabilitation Services, and Stroke.

Information was also provided by two patients who were unable to travel to attend the Focus Groups, but wished to contribute information about their experiences. An interview was conducted with a stroke patient and a written report was received from a patient who had received care through Rehabilitation Services. The three Focus Groups were conducted by the same researcher from Health Consumers Alliance of SA Inc, who also conducted the interview to ensure consistency of approach.

The Focus Groups and interview were recorded and professionally transcribed for data analysis.

For simplicity the Focus Groups, interview and written report will all be referred to as ”Focus Groups” for the remainder of this report.

Results of the evaluation were also discussed with the TH Consumer and Community Engagement Committee.

4.2 Analysis of Focus Group Data

Analysis of the transcript data was conducted using a thematic approach, which involved coding the data and identifying themes that emerged across all the data. Ideally, data would have been collected pre and post implementation of the models of care, analysed for emerging themes of patient centred care, and pre and post themes compared. As this was not possible due to the lack of pre-implementation data, themes were used that had been previously defined from a framework for patient centred care that was developed by Kitson et al (2013). They reviewed sixty key papers to identify the common, core elements of patient centred care in the health policy, medical and nursing literature and developed a framework to identify characteristics of patient centred care in themes, sub-themes and categories (**Table 1**).

Each researcher checked one of the Focus Group transcripts for accuracy and conducted initial coding of key patient comments. One researcher checked the interview transcript and coded this data and the data in the written report.

Key patient comments from the transcripts were classified as positive or negative perceptions and examined for their fit with the themes and categories in the Kitson framework. In addition, researchers looked for new themes and categories where comments did not fit the framework.

The three researchers collaborated throughout the analysis to share their interpretation and understanding of the patient centred care data, and to determine final codes, themes and categories for the key patient comments.

This hybrid approach to analysis (Fereday, 2006) used a data-driven, deductive approach together with inductive coding. Existing themes and categories from the Kitson framework were used for the analysis process and at the same time researchers identified new themes or categories where transcript comments did not fit into the framework.

Table 1. Kitson Framework: Themes, sub-themes and categories of patient centred care (PCC) (Kitson et al., 2013)

Themes	Sub-themes	Categories
1. Patient participation and involvement	Patient participating as a respected and autonomous individual	Respect for patient values, preferences, and expressed needs Patient as a source of control Patient actively involved and participating Autonomy
	Care plan based on patient's individual needs	Care customized according to patient needs and values Transition and continuity
	Addressing a patient's physical and emotional needs	Physical comfort, physical care Emotional support Alleviation of anxiety
2. Relationship between patient and health professional	Genuine clinician – patient relationship	Care based on a continuous healing relationship Clinician patient relationship
	Open communication of knowledge, personal expertise, and clinical expertise between the patient and the professional	Knowledge shared and information flows freely Information, communication and education Feedback mechanisms to measure patient experience
	Health professionals have appropriate skills and knowledge	Skill and competency Attributes of the patient centred professional
	A cohesive and co-operative team of professionals	Cooperation amongst clinicians a priority Differences in perception of role between doctors, nurse, and patients
3. The context where care is delivered.	System issues	Policy practice continuum/language used Access Institute for Patient and Family Centred Care (2008) Barriers to patient centred care Supportive organizational system Therapeutic environment

4.3 Data from the 2016 SA Health SACESS Survey

The 2016 SA Health SACESS Survey (Grant, Khan, & Taylor, 2017) provides information about patients' experiences in metropolitan and country hospitals during 2016. SA Health gathers feedback from patients via a telephone survey. Information on all aspects of a person's stay is collected from their involvement in decision making, privacy and pain control, to hospital cleanliness and food quality.

Responses in 2016 from 2,310 consumers provided data that was analysed to indicate performance in the following four areas:

- Picker Institute Domains (ten core domains of care relating to consumer experience defined by the Picker Institute, which is responsible for designing, validating and updating all patient experience surveys for the Care Quality Commission and the National Health Service, United Kingdom)
- SA Health Key Performance Indicator (KPI) Involvement in care and treatment
- Additional areas of care defined by SA Health
- National Set of Core Common Patient Experience Questions (National Health Standards & Statistics Committee).

In order to compare data from the Focus groups and the SACESS Survey, the different areas of the SACESS Survey were examined, and indicators from these areas were selected that were relevant to characteristics of the patient centred experience used for the analysis of the Focus Groups **Table 3**.

5. Results and discussion

5.1 Focus Groups

5.1.1 Participant Details

From the 271 letters sent to patients/carers/families inviting them to participate in the evaluation, 19 people responded (response rate = 7%). Seventeen people participated in the Focus Groups, one in a face-to-face interview, and one provided a written report of their experiences.

Information was obtained from the 19 participants about their gender, age, cultural background and the model of care they had experienced.

The gender distribution of the participants, and the models of care they experienced, are shown in Table 2.

Table 2. Gender distribution of participants and models of care

Focus Group, Interview or Written report	Models of care	Participant Type	Female	Male	Total
Focus Group 3	Acute Coronary Syndrome	4 patients + 1 carer	2	5	7
	Acute Coronary Syndrome & Rehabilitation	2 patients			
Focus Group 2	Stroke	1 patient	1	3	4
	Stroke & Rehabilitation	2 patients + 1 carer			
Focus Group 1	Stroke & Rehabilitation	4 patients	1	5	6
	Stroke	1 patient			
	Orthogeriatric Hip Fracture & Management	1 patient			
Written Report	Rehabilitation	1 patient	1	0	1
Interview	Stroke & Rehabilitation	1 patient	0	1	1
TOTAL			5	14	19

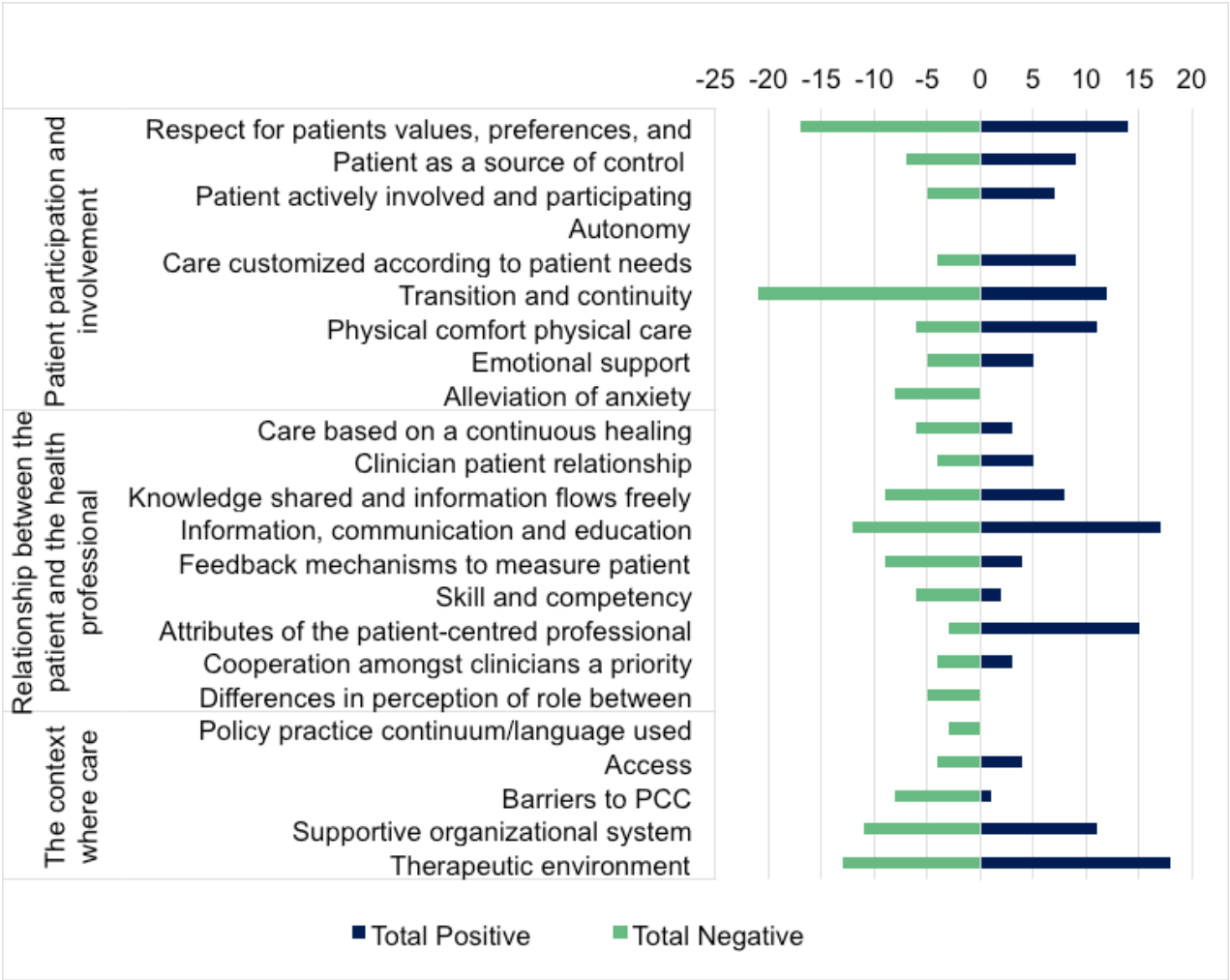
On completion of the Focus Groups, demographics and feedback were provided voluntarily by 14 of the 17 participants. The demographics of these 14 respondents were compared with demographics of the whole cohort of all patients who were invited to participate, as they had experienced care under the relevant models of care in CALHN and NALHN. The small number of participants did not allow for meaningful analysis of these data but it is interesting to note the following demographics of Focus Group participants:

- 72% were male vs 58% of whole cohort
- 100% were over 45 years of age vs 89% of whole cohort
- no participants identified as Aboriginal or Torres Strait Islander descendants, vs 1% of whole cohort
- 29% of participants spoke a language other than English as the main language at home vs 20% of whole cohort.

5.1.2 Participants' Comments

To provide an overview of which areas of patient centred care were mentioned most often by participants, each key participant comment from the transcripts was classified either as a positive or negative. These comments were then fitted into a theme and category of patient centred care defined by the framework shown in **Table 1**. The total numbers of positive comments or negative comments for each category were then calculated. Results are given in **Figure 1** which shows themes on the left, categories for each theme in the middle and the frequencies of positive and negative comments in each category on the right.

Figure 1. Positive & Negative Reponses by Themes & Categories of the Kitson Framework for Patient Centred Care (PCC)



5.1.3 Discussion of Participants' Comments

This section explores, for each of the three themes, participants' perceptions of the care that they experienced, and the frequency of positives and negatives in each category of the Kitson framework as shown in **Figure 1**.

Where participants' quotes are used, information regarding the gender of the participant and the Focus Group attended is provided.

THEME 1: PATIENT PARTICIPATION AND INVOLVEMENT

Under the Theme Patient Participation and Involvement (**Figure 1**), the two categories participants most frequently commented on were *Respect for patient values, preferences, and expressed needs, and Transition and continuity*

Respect for patient values, preferences, and expressed needs

Participants felt that their values, preferences, and expressed needs were being respected when families or carers were involved in their care and when staff communicated with them regarding decisions about care.

> *"The staff that we had were really good – they allowed L to sit in too, with all the sessions and actually made sure that she knew what I was doing all the time, which was good because she's classified as my carer when I'm not in hospital." (Male FG2)*

> *"I was up on Level X and people that I had there they actually listened to what I was saying most of the time. But I had a really good experience all around." (Male FG2)*

However, dissatisfaction in this category was expressed by several participants who felt the preferences and needs that they expressed were not listened to.

> *"I was trying to get across to these two (clinical staff) that it wasn't suitable for E and it wasn't necessary because she'd just been on that, finished, and then …. they're putting her back on it. … they should take note of older people." (Male FG2)*

> *"… the people unfortunately talk at you rather than with you and my Dad was ninety-one, he had a fully functioning mind and unfortunately we found that sometimes people didn't involve Dad in the decision making." (Carer FG3)*

> *"I asked for a sick bag …. she said well don't do that, you'll aspirate and die or you'll choke or something. And then she just left the room and because I didn't know what would happen if I vomited too intensely or to my heart and … with me the leads kept popping off the monitor and that's the only time I ever saw a nurse and except for change over." (Female FG3)*

Patients also felt their needs concerning discharge from hospital were not listened to. One patient lacked the confidence to return home, but the doctor who informed him about his discharge two days earlier than expected, did not try to alleviate his anxiety by explaining why this decision had been made.

> *"And then the doctor came in and one who I had never seen before and they told me 'you're going out.' I said, 'How can I, I have no confidence in myself, there's nobody home at my place, and I'm still wobbly. So how can, how can you send me home? I need at least another two days.' Nothing. I said, 'How do you know? You've never seen me.' He said, 'It's all here.' I had to go, but that is wrong I, I think it is wrong" (Male FG2)*

> *"In the end they wanted my bed so I had to spend – because I had to wait for discharge stuff and that to be done, so I got left sitting in the corridor for about five hours. And then lunchtime came and went – oh no you're discharged you don't get lunch, so I was just left sitting there waiting. And then my wife, I rang her, she came, she had to wait for three hours and then what are you doing here, where's my notes, hadn't the doctor got back to you yet; it was a bit blasé, it wasn't a real good hand over experience." (Male FG3)*

Addressing a patient's physical and emotional needs is an important part of patient participation and involvement. Thus when patients were not listened to, their physical and emotional needs were not being met and their involvement in the care was jeopardised.

Transition and continuity

The category of Transition and continuity drew a large number of comments, both positive and negative, from participants. Transition can involve transfer between hospitals, as with patients admitted for stroke to one hospital and transferred to another for rehabilitation, or being discharged from hospital, most often to the patient's home.

Transfer between hospitals caused concern in several areas for patients, who were often given insufficient notice about the transfer.

> *"I did express to them that I needed to know I was being transferred from one hospital to the other, within, with plenty of time. 'Oh yeah we'll be able to tell the day before. Well it was, they came in and said it, You're moving in an hour.' By which stage we'd missed the shuttle bus so I had to get the ambulance over and so, that part was a bit of a balls up." (Male FG2)*

When patients arrived at the new hospital, first impressions and transfer of patient information were important.

> *"The day I was transferred the nurse on the desk was really good and I thought, this is going to be good and it was, the other ladies in the ward were good." (Female FG2)*

> *"More information – it's got to be passed from that one to that one so that when you go there they've got all the information." (Male FG2)*

Where patient details had not been transferred, problems occurred with continuity of care.

> *"The day before she was discharged from up there, with the view of coming up here for rehabilitation, they put her on an ordinary diet. So she was happy, she had her first cup of tea that she'd missed for so many days… so we come up here then they put her back on this thick diet, and I was trying to get across that it wasn't suitable and it wasn't necessary …. and then come up here and they're putting her back on it." (Male FG2)*

Another issue for patients who were transferred between hospitals concerned the delay to commencing their rehabilitation program. Patients were keen to commence this as soon as possible, but if transfer occurred before a weekend on a Thursday or Friday, it was delayed until the following Monday.

> *"She lost about four days treatment with the long weekend." (Male FG2)*

> *"Unfortunately, as I came on Thursday, I didn't really see anybody until Monday." (Male FG1)*

> *"So, the Friday you see all your – well we're going to do this for you, we're going to that for you. And then Friday night comes, and everyone goes home, and like, it's, oh, what can I do today to get my hand moving today – oh, we don't go to the gym or anything on the weekends, and – so, yeah, it didn't really kick in until the Monday, did it?" (Female FG2)*

Concerning discharge from hospital, there was a general consensus that it often occurred too early, but the discharge procedure and ongoing care were well organised.

> *"The pharmacist came down with a list of the tablets that I was taking and … They made an appointment for the physio to come out to assess what I needed around the house… everything was set up before I left, even to the point of making an appointment with my doctor." (Male FG2)*

However, this organisation seemed to be lacking when a patient had been transferred between hospitals.

"But I think with coming, going, coming out of this hospital and then getting put back into another, everything was … you didn't know who was covering you… so the left-hand didn't know what the right-hand was doing." (Male FG2)

Patients were keen to continue their rehabilitation after discharge, but at times this was not possible.

"They are very good. My only complaint was with the discharge – there was a waiting period between the time I left here and the time I went to SpARC (Specialist Ambulatory & Rehabilitation Centre." (Male FG2)

Overall, comments from patients regarding discharge indicate that the support system for discharge is well organised in some aspects, but a lack of communication between hospitals and a delay in rehabilitation can hinder transition and continuity needed for patient centred care.

Care customised according to patient needs and values.

Patients were generally satisfied with the way care was customised according to their needs and values.

"Yeah, like I had that home rehabilitation set-up and they gave me two iPads … rehab or whatever they call it. Yeah, it was good, it was alright. Just had to find time to self-motivate yourself to do exercises and then there was no worries with the sessions." (Male FG1)

The provision of iPads to help with rehabilitation was meeting this patient's needs by providing him with control over his rehabilitation program and the motivation to be involved.

Thus for the Theme of Patient Participation and Involvement, patients were successfully involved in their care when there was good communication and respect for their expressed needs. There were negative perceptions concerning transfer between hospitals and discharge from hospital, and problems around these processes affected continuity of patient centred care. Patients and carers expressed frustration when their needs, values and preferences were not listened to, meaning they were not able to participate in care as respected and autonomous individuals.

THEME 2: RELATIONSHIP BETWEEN THE PATIENT AND THE HEALTH PROFESSIONAL

Under the theme Relationship Between the Patient and the Health Professional, the categories most frequently commented on concerned Information, communication and education, Knowledge shared and information flows freely, together with Attributes of the patient centred professional (**Figure 1**).

Information, communication and education and Knowledge shared and information flows freely

Good communication between staff helped to coordinate clinical care.

"It was good that when the physiotherapist came, she already knew what I'd been talking about with the occupational therapist because it was all in the one sheet, and they all knew what was going on and what was happening." (Male FG2)

Patients were positive about rehabilitation sessions at Modbury Hospital as they provided education for returning home and kept patients informed about the schedule.

"My rehab here was excellent … there was the occupational therapist with the fine motor skills and they took me down, we did some cooking before I went home. And the rehab sessions that I had were, they had it up on a blackboard as to what you were doing the next day." (Male FG2)

However patients became frustrated when information and knowledge was not shared with them.

"One morning I had a cholesterol tablet turn up in my pills, and I thought 'No one's actually explained to me why I'm taking this next tablet and I don't have cholesterol,' that was why… until an actual doctor came to me and said, 'This is why you're taking this cholesterol tablet.' But up until that stage, no one had really been in to tell me…Yeah, so, I did take it. I know I'm at the hands of all of you, because you've got all the knowledge, and I'm just taking everything as gospel at the moment, but I'd like the information as to why." (Female FG1)

When information and knowledge is not shared with patients it means they are not actively involved in their care and this decreases patient autonomy and control.

Lack of communication of information affected important processes such as transfer between hospitals, when patients were not given sufficient notice to prepare for the transfer, and continuity of care, when insufficient information was provided by transferring hospitals.

Part of open communication between patients, carers and health professionals is ensuring that there are efficient feedback mechanisms to measure patient experience. However, comments from participants in this research showed that the majority had not been informed about their rights and how to provide feedback during their stay, or on discharge via the feedback form in the pack provided on admission.

> *"It would probably have been a good thing to know, like, Who do I ask about that?, or Who do I say I wasn't really happy about that to?" (Female FG1)*

When patients are unaware of how to provide feedback, open communication between the patient and health professional is affected and an important source of control for patients is lost.

However, some patients were happy to provide feedback directly to staff if the need arose.

> *"Oh no, I didn't (know that there was a, a way of providing feedback or if things weren't going as planned), but I would have anyway because I'm pretty abrupt and I go straight out." (Male FG2)*

> *"No, I didn't get any information from them, but I was okay, I was alert, I could ask questions, so I was okay and I had a good experience; the nurses were good, it was okay." (Male FG3)*

Attributes of the patient centred professional

The number of positive comments about the attributes of the patient centred professional, far outweighed the number of negative comments. Participants were very positive about the skills and knowledge of staff, with one stroke patient describing staff as:

> *..helpful and kind. They couldn't have helped me any more (than they did). There's not a thing I could find fault with. (Patient Interview)*

And more generally:

> *"I've seen nursing staff abused and it's disgusting and I don't know how they put up with it and continue to apply the same standards they always have to patient care." (Male FG3)*

Another patient spoke highly of staff involved in caring for her:

> *"The professionalism and treatment by both doctors and nurse was excellent. Doctors and nurses in ED showed a great deal of competence and were empathetic at all times. Attending doctors, nurses and physiotherapy staff were excellent in caring for me." (Patient letter)*

The relationship between the patient and the health professional seemed to vary according to the hospital that patients were admitted to.

> *"(At one hospital) you would find it hard to get someone to look after you. Whereas at the other, you press a button and there's someone there. They can't do enough for you." (Male Interview)*

This variation relating to the context of where care is delivered, can act as a barrier to patient centred care.

Negative comments about staff often related to what patients perceived as lack of suitability to their role, and this could affect their ability to meet patients' physical needs.

> *"As everyone has said 99% of the staff that we dealt with were excellent. Some of the staff are not suited for that position." (Male FG2)*

> *"I do have asthma and I cough, and the lady across she had asthma and she coughed. This young nurse said, 'Oh this is freaking me out this coughing. I can't breathe.' She ran out the room – never saw her again." (Female FG2)*

"So the nurse came … and I said to her, 'Do you think you could raise the bed up a little bit more and maybe another pillow?' And she said, 'Shh – you'll wake the others.' I said, 'If I haven't woken them with coughing, they're not going to wake.' And she walked out the room – that was it." (Female FG2)

Thus, staff not suited to their role showed a lack of competency and the professional attributes essential for a sound patient-clinician relationship.

Patients respected staff who were capable and confident in their approach.

"I had a, a good experience here, my first night here I got up to go to the toilet … I rang the bell. And the nurse came and I was walking along the walls to keep my balance and she said to me, 'Are you going, either I'm going to be hanging onto you or I'm going to get an aid.' And that was like according to my mind that there was going to be no mucking around." (Male FG2)

"So being in the hospital having a set routine's good….Coming in and saying, 'You've got to get up,' or 'What are you doing in bed?' – even though some might take that as disrespect, by this stage I was put into a ward with three other blokes … and that was probably one of the best moves that they did, was put me into a group room because I saw that there were people there that were a lot worse off than I was". (Male FG2)

These staff were able to openly communicate their knowledge and demonstrate clinical expertise to build a genuine patient-clinician relationship.

However, disrespectful communication by staff can be upsetting, as in incidents commented on by patients' carers.

"They go on about people in the hospitals, patients getting aggressive with punching the doctors and things like that. And no wonder if people like him are saying things like that to them, it's only natural you're going to get a little bit upset." (Husband carer FG2)

"I would've thought that people could've said that they're sorry or said something compassionate...it wouldn't take them too long to have just said that five letter word and that would've helped me at that point in time. Just handed a big bag of his things and said well, we'll deal with it, the body will go to the morgue eventually etc. and I then left. So I suppose respect for the relatives as well as… we should think about the respect for the person themselves, we need to go to that next level." (Daughter carer FG3)

These incidents showed a lack of respect for patient needs being expressed by their carer, and this prevented carers from being involved in patient care as respected and autonomous individuals.

Lack of clarity around staff roles led to confusion for both staff and patients.

"In case it wasn't a definite stroke I had the MRI and doctors came up later and we were talking away. And then they went away and about an hour later the stroke nurse came back with a stroke pack. And after he said a few things I looked at him and I said, 'I gather you've, you've got results back from the MRI?' And he just went white; he thought I'd already been told I'd had a stroke." (Male FG2)

"...nobody talked and the right hand didn't know what the left hand was doing. But lucky I had my wits with me and I knew and I said no, I had that done; oh yeah, they'd go and come back yeah, you're right, you have had that done." (Male F3)

This confusion in the first example, about which staff member should inform the patient of the diagnosis, and in the second example about patient treatment, showed a lack of cohesion among the team of clinicians.

Thus, for the theme of Relationship between the patient and the health professional, consumers highly valued the attributes of the professional staff providing their care. The majority of comments concerned Communication and education and the flow of information, with slightly more positives than negatives, which included the lack of information for consumers on how to provide feedback throughout the whole of their health care experience.

The SACESS Survey gathers feedback form patients after they have left hospital (Section 4.3), but there also needs to be ways for patients and carers to provide feedback on incidents, both positive and negative, as they occur during a patient's hospital stay and on discharge, to ensure accurate recall of details.

THEME 3: THE CONTEXT WHERE CARE IS DELIVERED

For the theme The Context Where Care is Delivered, the categories most frequently commented on related to the Therapeutic environment and the Supportive organisational system (**Figure 1**).

The therapeutic environment

Patients' perceptions about the therapeutic environment varied according to the context where the care was provided, and comments mainly concerned staff and the quality of food in the different hospitals.

> *"I'd be okay going back to Modbury Hospital, definitely, because it's much easier and friendlier." (Male Interview)*
>
> *"Well I went to the Lyell McEwin. And that's a hell-hole. And so, they sent me to Modbury, and the meals there were good. At Lyell McEwin you would find it hard to get someone to look after you whereas at the Modbury, you press a button and there's someone there." (Male Interview)*
>
> *"I was really concerned that the health departments associated with organisations that are flogging Coke and whatever else, there's a real contradiction going on with suffering because of the gross consumption of fats and especially sugars and then that's all that's available in that area." (Male FG3)*
>
> *"I know my food pretty well because I've been a diabetic for over twenty years and I watch everything and they put stuff on there like Cornflakes which is high in sugar and they say it's a diabetic meal, it's bloody well not a diabetic meal." (Male FG3)*

There were several positive comments about the therapeutic environment provided by the Rehabilitation Services model of care at Modbury Hospital.

> *"Had a stroke in July. Had a week in rehab here and I've been and used the pool which was brilliant and got me moving straight away. I was lucky the facility was here to use. The staff were wonderful and being away from home I just felt I had someone I could ask lots of questions to all the time." (Male FG1)*
>
> *"Yeah (I would come back) anytime, I don't want to go anywhere else actually. The rehab, … I was sent there for six weeks and that is excellent." (Male FG2)*

Patients found this rehabilitation program provided a supportive organisational system, with staff who communicated knowledge and information effectively, and cooperated as a team to customise individual programs for patients according to their needs.

Access

Regarding the category of Access, country patients' comments related to accessing care at the beginning of their illness (acute episode), and after being discharged.

> *"Had a doctor see me, straight into the ED, you know, and got attached and God knows what, and rang up the Flying Doctor, and straight down to Adelaide. And I came through that fairly well actually." (Male FG1)*

Another stroke patient commented on the delay in access to care as he was transferred from place to place, and he wondered if this affected the final outcome of his stroke.

For a stroke patient whose main language was not English, access to care was helped through the involvement of his family as staff communicated through his wife and daughter. He was also able to access care at home from a physiotherapist and occupational therapist.

Barriers to patient centred care

Participants perceived that the main barriers to patient centred care were staff not having sufficient time to carry out their roles, and the lack of suitability of some staff to their positions.

> *"Well they did seem to be rushed as if there's not enough staff. There was one nurse really good older, but she was very attentive but… she would say, 'I'll be back in a minute' and that minute might be 30, but because she's rushed off her feet." (Female FG2)*

> *"Staff levels possibly being increased could help – the physiotherapists were fairly good when they had the students there… but when the student had gone they, they were a bit more stretched" (Male FG2).*

> *"Some of the staff are not suited for that position." (Male FG2)*

Lack of staff numbers and time point to system issues and can be barriers that affect the context of the health delivery. Unsuitability of staff who have difficulty meeting patient needs reflects attributes of the patient centred professional that are detrimental to the patient-health professional relationship.

Thus, for the theme The Context Where Care is Delivered, positive comments centred on the Rehabilitation Services program at Modbury Hospital, reflecting satisfaction with the therapeutic environment and a supportive organisational system. The main barriers to patient centred care were perceived as a lack of time for staff to carry out their roles and lack of staff suitability, with both of these factors negatively affecting the therapeutic environment.

5.1.4 Summary of Focus Group Results

The largest numbers of positive comments from patients and carers were in the categories of Therapeutic environment and Information, communication and education. The largest numbers of negative comments were in the categories of Transition and continuity, and Respect for patient expressed needs.

The Rehabilitation Services model of care stood out as one that provided a supportive organisational system, and a positive therapeutic environment, with staff who communicated knowledge and information effectively.

Negative comments concerned:

- transfers between hospitals
- discharge from hospital
- open communication between staff and patients/carers so that knowledge and information flows freely
- the process of informing patients and carers of their rights and ways to provide feedback.

The patient experiences investigated in the Focus Groups, interview and written report can only be associated with the four models of care investigated, rather than attributed to them, as there would have been many other factors contributing to patient care at that time. Analysis of specific models of care and LHNs of implementation were not possible due to the small number of participants.

5.1.5 Themes and categories not covered by the Kitson framework

Whilst the majority of comments from consumers fitted into the categories of the framework for patient centred care (**Table 1**), the framework did not take into account the role of carers/families in the health care experience.Health care outcomes depend not only on patient participation and involvement and a good relationship between the patient and health professional, but also on how carers and families participate and are involved, and the relationship they develop with health professionals. With a population that is ageing and increasing in cultural diversity, the role of families and carers is becoming more important, and this could be included in any updated versions of the framework.

Reflected in this evaluation was the importance of the trust and confidence that the patient/carer has in the health care professional. When patients were cared for by a series of different doctors, they found it difficult to develop the trust and confidence that leads to a healing and continuous relationship.

One of the categories in the framework for patient centred care deals with the clinician-patient relationship, and trust and confidence could be included as qualities that are important for this relationship to be successful.

5.2 Results from the 2016 SA Health SACESS Survey

The SACESS Survey (Grant et al., 2017) collected data about health care performance in 2016 in four areas and used indicators in each of these areas as a performance measure. For this evaluation, indicators were identified that were relevant to the patient centred experience used for analysis of Focus Group data (**Table 3**). An explanation of how mean scores for the indicators were calculated is given at the bottom of the Table.

Table 3. Areas measuring health care performance in the 2016 SA Health SACESS Survey, and mean scores of indicators relevant to this evaluation (n=2310, 68.6% response rate)

Areas measuring health care performance and indicators relevant to this evaluation	**Mean Score** (SA Health Benchmark score = 85.0)
Picker Institute Domains:	
Treated with respect and dignity	93.0
Involvement in decision making as much as they wanted to be, in decisions about care, treatment and discharge information.	77.0
Discharge information (sufficient information provided to patient, family/carer, including who to contact if problem arises)	71.3
SA Health Key Performance Indicator (KPI)	
Involvement in care and treatment (dietary needs, consent, cultural/religious beliefs, access to interpreter)	69.0
Additional areas of care	
Consumer feedback (informed of process, comfortable providing feedback?)	58.2
Patient rights and engagement (information provided and explained?)	52.1
National Set of Core Common Patient Experience Questions	
Involvement of patients, as much as they wanted to be, in decisions about care	75.4
How often things were explained to patients by doctors, nurses and other health professionals in a way they could understand?	86.2
Discharge information – given enough on how to manage at home?	81.7
Discharge arrangements – adequate arrangements for any services needed?	81.2

Scores were calculated using the Picker Institute protocol which allocates an initial score of 100 to the most desirable response and the relevant percentage to the remaining responses, based on the number of response options, with the least desired response allocated “0”.

E.g. Sometimes in hospital, a staff member will say one thing & another will say something different. Did this happen to you? Response options: Yes, often (100); Yes, some of the time (50); No (0).

The mean score is the average of the responses to the group of questions from each domain. A score of 85 is designated as the SA Health benchmark, in accordance with the following Picker Institute scoring protocol:

90 = Above average

85 = South Australian (SA) benchmark

80 = Average (reasonable level–room for improvement/being monitored)

70 = Below average (poor level–immediate action required).

The above results from the 2016 SA Health SACESS Survey for indicators relevant to this research were in general agreement with the comments from Focus Group participants.

- Regarding patient/carer Involvement in decision making as much as they wanted to be, in decisions about care, mean scores from the SACESS Survey were below the SA benchmark (77.0, 75.4), and comments from the Focus Groups and interview revealed that barriers to involvement arose when people were not being listened to by staff, and when patients' physical and emotional needs were not met during transfer between hospitals.
- Participants in the Focus Groups and interview generally experienced good relationships with health professionals, only expressing dissatisfaction with staff that they perceived to be lacking in competency or respect, or where there was confusion around staff roles. In the SACESS Survey, these strong staff-patient relationships are reflected in the mean score of 86.2, above the SA benchmark, for responses to the question: How often things were explained to patients by doctors, nurses and other health professionals in a way they could understand?
- For the indicator Treated with respect and dignity, there was a conflict between results from the survey, where the indicator received a score (95.0) of well above average and above the South Australian (SA) benchmark, and results from the Focus Groups and interview. Under Theme 1, although the category Respect for patients' values, preferences, and expressed needs contained the highest number of positive comments, it also contained the second highest number of negative comments (**Figure 1**). Discussions with consumers revealed several instances where they experienced a lack of respect for their expressed needs, and these instances included not being listened to and being spoken to disrespectfully by staff.
- Findings from the Focus Groups showed that certain aspects of the discharge process could be improved and this was supported by indicators from the SACESS survey with mean scores of 71.3, 81.7 and 81.2, being below the SA benchmark.
- The indicators receiving the lowest mean score in the SACESS Survey were Consumer feedback (informed of process, comfortable providing feedback?) and Patient rights and engagement (information provided and explained?). Mean scores of 58.2 and 52.1 were well below average and the SA benchmark, and of the Focus Group participants, only one had been provided with this information. Results from two different sources confirm the need to review how people are informed about their rights and engagement, and how to provide feedback.

Thus, there was agreement in all but one area between participant comments from Focus Groups and results of the 2016 SACESS Survey.

Although comments came from only nineteen participants in the Focus Groups compared to over 2,000 respondents to the survey, discussions with participants have provided stories with specific details about the positive and negative aspects of patient centred care.

The SACESS Survey gave participants the opportunity to comment on any one issue about their hospital stay at the end of the phone interview. Compared with an interview where the participant is involved only with the interviewer, Focus Group discussions can trigger deeper responses from participants as they interact with other members of the group. It is these deeper responses that provide the specific details about the lessons that can be learned for future planning and implementation of patient centred care.

6. Summary of evaluation of the patient centred experience

Perceptions of patients and carers about their experiences in four models of care, introduced under Transforming Health, have been investigated through Focus Groups with seventeen participants, one interview and a patient report.

These perceptions were compared with results from the 2016 SA Health SACESS Survey for indicators relevant to the Kitson framework for patient centred care, and were in general agreement except for the indicator Treatment with respect and dignity.

Limitations of the evaluation included:

- Recruitment for the Focus Groups was limited to patients and carers under the four models of care which had been implemented for a sufficient length of time to generate short term outcomes.
- Participants were from CALHN and NALHN only.
- This evaluation did not extend to other models of care that were in the planning or early implementation phase.
- Participants may not be representative of the whole patient population with regard to gender and ethnicity.
- Participants who volunteered may have come with a particular agenda regarding their patient centred experience.

Findings that emerged from the stories that patients shared about their experiences include:

- Health professionals are to be complimented on the good relationships they generally experience with patients, and on providing information and explanations that can be understood.
- Patients need to be listened to, and spoken respectfully to when they express preferences and needs, especially concerning transfer between hospitals and discharge from hospital.
- Improvements are needed in the processes of informing people about their rights and engagement, and how to provide feedback on their care both during and at the end of their hospitalisation.

This overview of patient centred care also suggests that in any future research in this area, consideration should be given to the most appropriate methods of engaging consumers.

7. Conclusions

When investigating the hypothesis: 'The experience of patients receiving healthcare through Transforming Health is one that is patient centred', the Focus Groups, interview and written report, together with the 2016 SACESS Survey, have provided both positive and negative findings.

Broadly speaking there was an even spread of positive and negative responses provided by participants regarding the four models of care investigated. Some participants reported feeling engaged in care through their participation and involvement, and were positive about care being customised according to their needs, making their experience one that was patient centred.

What was also evident was that while patients could be treated under the same model of care and in the same therapeutic environment, they could have very different care experiences sometimes very positive and sometimes very negative. This suggests there is opportunity to explore and improve consistency of care processes within models of care and particularly in the areas of:

- transfers between hospitals
- discharge from hospital
- open communication between staff and patients/carers so that knowledge and information flows freely
- the process of informing patients and carers of their rights and ways to provide feedback.

Whilst patients had many positive experiences to share, we can learn from their concerns emerging from the Focus Groups and SACESS Survey about specifically where these improvements are needed.

The methods used here to collect feedback from patients and carers have generated a richness of data and could provide a useful platform to inform future strategies for evaluation in health care.

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10.3.3 Staff Engagement

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1. Executive Summary

A small study was undertaken to explore the extent to which Transforming Health provided an opportunity for professional growth for staff, in particular to develop their leadership skills, their resilience to change and their ability to collaborate across units. Interviews were conducted with 13 participants, all of whom had a key role in implementing a Transforming Health clinical project.

Evaluation questions focussed on staff perception of opportunities for personal growth and development as a result of Transforming Health; the extent to which initiatives such as the Leading Health Transformation program and Resilience Training have increased the leadership and resilience capabilities across SA Health; and evidence of greater cross unit/interdisciplinary collaboration and the form it takes.

The method taken focused on qualitative semi-structured interviews with participants. This method allowed the interviewees to tell their story and relate their perceptions of staff engagement and links to Transforming Health. Although there are limitations in extrapolating the data, given only 13 people were interviewed, nevertheless some themes began to emerge early on and remained consistent and by the final interview there were limited new data emerging

These themes could form the basis of recommendations for how health reform could be approached in the future, particularly in relation to staff engagement. Core concepts such as transparency around rationale, in this instance the 'business case for Transforming Health', establishing clear governance that empowered those at the local level to lead and implement projects, and clarity on the scope of decision making are a few of the important 'take home messages' from this evaluation. The similarity in views across clinical leads and project managers for the barriers and enablers to reform was interesting. On the other hand, there were some projects that were clearly going to progress without the impetus of Transforming Health and others where Transforming Health provided that authorising environment to create urgency.

Mark Moore's public value approach and the 'strategic triangle' were used as a theoretical framework to illustrate some of the themes that emerged from the interviews. The three processes that were recognised and aligned in his 'strategic triangle' were 'public value outcomes', 'authorising environment' and 'operational capacity'. The findings relating to the authorising environment were the most obvious links emerging from the interviews. Findings also related to public value outcomes and operational capacity.

In the absence of any baseline data, other than staff satisfaction surveys, there are limited conclusions to be made on the impact of Transforming Health on staff engagement, especially as participants tended to focus on the strategic management of Transforming Health overall. There are interesting quotes and insights, particularly from clinical leads, about the need to 'get people together in the room' and how the Transforming Health agenda may have enabled this. An ongoing concern is whether initiatives are sustainable beyond the urgency and mandate created by Transforming Health.

This small scale evaluation could form the basis of recommendations for those in leadership roles in the Local Health Networks, statewide services and the Department for Health and Ageing centrally, relating to resourcing and governance for any future reform. There is a clearly a strong affiliation among staff in the Local Health Networks to their Local Health Network and this largely overrides any sense of belonging to SA Health as a statewide entity. This warrants further exploration and specific recommendations to understand the barriers and enablers to staff engagement at a deeper level.

2. Background

The Transforming Health Evaluation Working Group identified staff engagement as a topic for further exploration. Although there is a significant body of literature on change management and on the well-being, leadership and engagement of health professionals, the change the health system is undergoing in South Australia is significant and there is no research specific to the South Australian context and how it could impact on the health workforce.

A key paper relating to an evaluation of workforce and service reconfiguration in New Zealand (Australian Health Review, 2013) touched on the issues of sustainability and ownership of the 'vision'. The sustainability of staff engagement and workforce capacity building with Transforming Health, and the ongoing ownership of the goals, are key parts of this evaluation in South Australia. One of the findings from the New Zealand evaluation was that their approach of using funded 'review groups' was a means and not an endpoint. The review group approach meant that an interdisciplinary group of professionals came together and new ways of thinking emerged. Lack of clarity about the ownership of the vision and the next steps constrained the groups. Part of the success was attributed to the review groups having expertise in complex systems and change management, using a lead clinician to facilitate effective group process and get useful outcomes, and having a skilled project manager. There are several recommendations and messages from this New Zealand research that can be used to assist the Transforming Health evaluation.

A study in the United States (Human Resources for Health, 2016) examined how workforce changes were being managed in two health systems. The approach in this U.S. study was to explore the dynamic processes and interactions and also to try to understand educational and training pathways and the management of performance. Their approach drew on literature from hospital restructures in the 1990s that highlighted the barriers to effective workforce change, including:

- Goals for change not clear
- Too many changes implemented too quickly
- Lack of communication with employees
- Lack of engagement with physicians and unions
- Poor understanding of local site differences and 'one size fits all' approach
- Training needs not anticipated.

The two case studies in the U.S. provided some findings useful to inform our evaluation approach. One specific element of the approach was having a rigorous methodology to assess the impact on jobs. This approach led to new jobs being proposed and these roles crossed existing occupational and union boundaries and jurisdictions. One of the challenges identified was the difficulty in getting jobs renamed and redefined. In summary, the two health systems in the U.S. in this study shared 'a common understanding of the centrality of the workforce in any delivery system change process' (p10). Five themes present in both systems were:

- The organisations had a strong set of core values and a centralised vision with regard to their goals
- A commitment to transparency and collaboration with key partners including unions
- Basing change on innovation and being responsive to demands
- New patterns of working in partnership, streamlining administration and tightening connections with stakeholders
- Working hard to continuously mature the approach and ensuring change agents had a deep knowledge of the dynamics and helping people 'make sense' of the change.

This evaluation was undertaken as we identified a risk that the impact on staff and their level of engagement with Transforming Health may not be prioritised given the number of other indicators available to measure the success or otherwise of this reform. Staff across the Local Health Networks are deemed as a major input to the process of Transforming Health and so their perceptions are important. The primary hypothesis to explore in this evaluation is that Transforming Health provided an opportunity for professional growth for staff and for them to specifically to develop their leadership skills and their resilience to change and their ability to collaborate across units. Evaluation questions were:

- On reflection, how much have staff perceived there are more opportunities for personal growth and development as a result of Transforming Health?
- To what extent have initiatives such as the Leading Health Transformation program and Resilience Training increased the leadership and resilience capabilities across SA Health?
- Is there evidence of greater cross unit/interdisciplinary collaboration and what form does it take?

3. Method

The method taken focused on qualitative semi-structured interviews with key informants and a review of the evaluation data from the leadership program. The project obtained ethics and governance approval, reference HREC/17/SAH/52 on 4th August 2017. Timelines are set out below.

1	Review literature	May 2017
2	Finalise interview proforma	May 2017
3	Ethics and governance approval sought	June 2017
4	Contact interviewees to recruit for interviews	August – November 2017
5	Send information and consent forms to interviewees	August - December 2017
6	Conduct interviews	September 2017 – January 2018
7	Interviews transcribed	October 2017 – January 2018
8	Interview data analysed	December 2017 – January 2018
9	Final report	February 2018
10	Papers for publication	March – July 2018

Semi structured interviews chosen as most appropriate method to gather data from key informants. This would allow the interviewees to tell their story and relate their perceptions of staff engagement and links to Transforming Health. Most interviews were conducted face to face and at the site where the person worked. A small number were done by telephone. Interviews were audio recorded and transcribed and most lasted between thirty minutes and one hour.

Interview data were analysed as an iterative process from the fourth interview on. Interview transcripts were read and concepts emerging from the data were recorded and compared across the two researchers. These were then tested and refined against the remaining transcripts and theories around staff engagement and transforming health were developed based on those data.

4. Results

A total of 13 interviews were conducted between September 2017 and January 2018. Five interviewees were clinicians who had lead roles with Transforming Health and others were staff with roles such as project manager. Six interviewees were female. Common concepts emerging from the interview data are set out below.

Mark Moore's public value approach (Moore, 1995) and the 'strategic triangle' can be used as a theoretical framework to illustrate some of the themes that emerged from the interviews. The three processes that need to be recognised and aligned in his 'strategic triangle' are 'public value outcomes', 'authorising environment' and 'operational capacity'. The findings relating to the authorising environment are the most obvious links emerging from the interviews. The other facets (public value proposition and operational capacity) also relate to the findings as set out below.

4.1 Public Value Outcomes

In considering this aspect, what the public value proposition is as it relates to Transforming Health and, the following points are made. One issue to emerge was a perceived lack of transparency in the rationale relating to the value proposition. An example relates to the business case for Transforming Health not being released or even being available to project managers and the likely impact on staff engagement:

> *"… the business case for Transforming Health should've been released warts and all right from the start… and I think by not doing that it led to a lot of suspicion…"*
>
> *"I just think that probably a more open and transparent process, they might have done a better job at engaging staff and not having such a – untrusting – I kind of feel like staff …. didn't trust the whole process because there was no transparency or honesty from the beginning."*
>
> *"I don't think anyone has any, or had any disagreement with first time quality and right place, right time, and that. You know, it's about quality but I think it was also about cost and that was not acknowledged. And I think if they maybe acknowledged that up front, it's like well yeah, we know we're an aging state and our health budget is going to be everything by a certain time. I think it was probably that maybe acknowledging that up front, but I think also the data wasn't necessarily, I think it was a bit of pick and choose the data to show what they wanted, I think. It was quite pre-determined early on and there wasn't really a changing long term focus. I think that's the feeling of it. And it was all quite slick and all quite glossy".*

As well as a perceived lack of transparency, the limited available data on performance was also seen as a challenge to engagement:

> *"…. one of our biggest challenges when we first came into this was that no one actually knew whether or not we were doing a good job. No baseline – there'd be stuff that people would collect at a low level – very specific and detailed stuff which they'd then publish in a journal or something like that in a de-identified manner or whatever and there'd be lots and lots of things being collected… that often never saw the light of day or it was just managed within a department and you didn't share it around…*
>
> *"I think people felt that the data was presented in a way that there was the foregone conclusion that this is what was required, and I think there was a lot of scepticism around the data"*

In terms of staff engagement as an inherent part of the value proposition of Transforming Health, there was much reflection on the opportunities that Transforming Health could offer, with some caveats:

> *"Well I think it was a fantastic opportunity to change some of the, some old school thoughts about their, about well the silos and rearranging the system from these individual power bases that have just grown through history,…. it's not to say they're not doing good things, but as the health system, you can't have every single site doing specialty service…but it'll be really good to get a proper strategic direction and some pre-planning of how we engage with clinicians."*

> *"And I think Transforming Health certainly helped with that, so I think it helped the Department have some confidence that it was getting the right clinical feedback. And the feedback wasn't just from one group of people. So they didn't have to balance feedback between different special interest groups, they had a multidisciplinary/transdisciplinary forum that provided endorsement of clinical decisions. So I think from that point, MCAG was useful, and I think from that point, Transforming Health was successful in making those initial first steps and breaking down some resistance that actually not everybody gets what they want. And I think that's really been the, so for powerful vested interests, it's been very difficult for the system to say 'well actually we just can't accommodate that particular position'. So Transforming Health certainly has set some valuable precedents in taking on some of those things."*

One interviewee reflected on engagement and collaboration, in the context of Transforming Health coming to an end:

> *"I see pockets of collaboration but also seeing frustrations where the collaboration hasn't been taking place that it needs to …to have the local LHNs set up their project management offices and have greater collaboration between the likes of finance and clinicians and project managers and still seeing probably silo behaviour and activity that we're trying to change in some ways but then in some of the models of care, implementations that we're seeing which involve clinicians or involve groups across LHNs we are seeing better collaboration and then we're also seeing – I guess I've seen cyclical patterns as well that as Transforming Health has come towards an end or people have seen it coming towards its natural end, some of those old silos have started to re-establish themselves as turf wars start to play out to try and go back to the older way of operating rather the Transforming Health way of operating."*

Another example related to the scope of Transforming Health and link to the new Royal Adelaide Hospital and outcomes around collaboration:

> *"The commissioning of the new Royal Adelaide wasn't part of transforming health but you can see that that was a beacon of success in terms of collaboration because you have all of these old ways of operating that just couldn't happen particularly involving country and the networks but just through assessing they had to agree and they had to put away some of those old ways of operating to come up with a new way of operating and you now see you know country and others leveraging off of that to try and continue that to be the new norm of operating and others saying well it worked for that why can't it continue to work moving forward?"*

Some interviewees reflected on a greatly increased sense of engagement and collaboration across the system:

> *"I think that's been one of the real positives out of Transforming Health, is everybody coming together. …And everyone was very much about what's best for the patient. And so that was good, and I think for me developing those relationships as well, between the other divisions and corporate services and all of those sort of groups of people and I think what I was impressed about is everyone had the patient at the focus. And coming up with a win/win for everyone. Not just for the patients but also for the staff, working together to how we can we do this in the easiest, simplest way".*

"I think there was over 30 people at one of our sessions from all disciplines, so you know, there was nursing, medical, physio, social worker, ACAT, rehab, everyone almost from all divisions, and for everyone to hear the patient journey from everyone's perspective was such a beneficial process, and then that sort of morphed into the …model of care"

"I don't think you can come through something like this and then go back to being separate and being in your own area. Because I think you can see what we can achieve when everyone works together".

"In [name of LHN] the amount of collaboration across disciplines has increased dramatically I think…. and that's despite a lot of people saying that there's less – what I saw prior to going into this transforming health process were a lot of units that managed their own business individually and would not venture to another unit to work up a plan for something heading forward that – because it was just too hard going outside their unit but when the transforming health stuff started at [name of LHN] we were forced into a situation where medicine, surgery, critical care were all at the table together and able to vent concerns and frustrations, plan together for significant system change which by its very nature had to be integrated with other areas…"

Another reiterated the value proposition of statewide approaches to providing a clinical service and levels of engagement with the process:

"… this had to be state wide …and I sort of believe in dispersing the operational,…but there's still kind of four or five different approaches to what tools do we use…and there's really no sensible reason for that…I think for the … models of care, the TH methodology and as I said, much to my surprise because I was pretty cynical about it to start with, actually worked really well … it was just actually people turned up to these really inconvenient meetings at four o'clock in the afternoon at somewhere that's got crappy parking and you've literally got huge numbers of people and you could just walk around the room and see that people were genuinely discussing and engaging and by and large when you talked to individuals afterwards they actually felt that they'd been engaged, so I kind of changed my views about it."

There were also examples of the same LHN struggling to get collaboration in certain areas and that this was down to personalities and leadership issues. Some of the comments linked the value proposition to the operational capacity for getting change happening:

"I think a number of things contributed to this not being the accepted approach that collaboration across disciplines needs to happen for these things to work. Those things that contributed to that were – that we were stagnating in South Australia. We were just doing business as usual …because we weren't changing how we did business, and everything's getting more expensive, then we didn't have the opportunity to … think about big picture engagement with other teams and so forth so they had their hands full just dealing with business as usual – but to some extent …our eyes have been opened to the fact that if you do invest a bit upfront in getting a team approach to something, then you can see the benefits afterwards and I think around the crew here we're starting to relax a little bit."

Another comment related to how the value proposition and clinician engagement could be undermined by ineffective communication:

> *"So that's the problem, we've tried to reward engagement … by listening and consulting and taking feedback and not by giving people stuff, but by actually making sure they feel they've been listened too. The problem is we've also sent the message that if you sit outside and throw rocks through Facebook you'll probably win as well and maybe win bigger. So we've created this dual way …"*

The investment in communication was criticised by one respondent who felt it bordered on 'propaganda' and that the forums that were held previously through the networks could be as effective for engagement:

> *"I think we live in a bit of a post-spin age where if something marketed in such a way that the hype outweighs the reality, that that can turn people off…The historic engagement forum that we held …I think they were good forums and lots of people had lots of good ideas that they articulated there and that were included in the plan. So I think the … forums, for the specific disciplines were quite good, but the…and then, I'm not sure that they were positive overall."*

4.2 Operational Capacity

Many comments related to the ability of the system to harness and deploy appropriate operational resources to achieve the desired outcomes of Transforming Health. The feedback from interviewees suggested that the balance between the expertise of the project manager and the leadership of the clinician heading up the project was paramount to the timely success of the projects and productive engagement. The expertise of the project managers was defined by their depth and breadth. They needed insight to be able to tailor their approach to the preferred style of each clinical lead and to recognise their support role.

> *"The biggest fault when I've worked with different project officers is they within a fairly short space of time start to consider themselves content experts …and whenever I've found things have gotten into difficulty it's because the project officers start to assume they're content experts"*

The perceived lack of support for project managers was raised in different ways and included lack of opportunity to network across LHNs, to attend professional development training and to feel respected in the role.

One interviewee reflected on capacity for reform and change in the current workforce:

> *"I think we'll find relatively few South Australian senior doctors who have been involved in significant health care reform and the ones that have, are the few that have come from elsewhere. So, that's something that we've really needed to grow from within and I'm lucky enough that I've been exposed to it."*

There was varied evidence on the impact of the leadership program that had been part of the capacity building for staff involved in Transforming Health. The need for cultural change to support new leadership approaches was noted:

> *"The training is only going to be as effective as, you know, the cultural attitude of the organisation for change… if you're not going to have a culture that's going to support you implementing that leadership style or approach within the organisation, it's all for nothing … investing in enough time for the people to actually come in and implement their learnings…They talk about the strategic, the operational and the tactical. Well everybody's living in the tactical all the time…they don't have enough time to get the strategic."*

There were some specific examples of learning outcomes from the leadership program:

> *"It's definitely helped me to get that perspective of framework around leadership and reflecting on myself and which of those traits and you know, styles that I already have, but also areas sort of to be more aware of and sort of learning as I go. So very much it's early days but I can see that it will be very beneficial and we'll be able to use that sort of in everyday, really, so yeah, it's a very good process of reflection as well,…sort of practice, and just some those, you know, I think some of the things that are sticking with me is how do people perceive you when you leave the room? What do you leave in your wake? And I just thought oh that's such a really great thing to think about"*

> *"So, there were some specific tools and things that they demonstrated that I've put into practice to help with how I manage things…I think their biggest advantage of going through that process was actually breaking down the barriers between different clinical areas and being there at the same time as the executives, as the physiotherapists, as the physicians, as all these other areas all the LHNs and appreciating that there are commonalities and that there are benefits to cross collaboration and cross fertilisation …and that there's additional benefits just from having SA Health invest in that program for engagemen… I think I'm better equipped to do my job and that's been good in some ways – in many ways."*

Some reflected on the need for the delivery of the leadership program to be tailored to the Australian context:

> *"they had some very good speakers in…Because they kept flying these guys out from the UK who were really high quality, absolutely cannot doubt their credentials, but …hey'd have no understanding of the public versus private system in Australia, they'd have no understanding of funding arrangements and would have no understanding of how unionised our workforce is…So absolutely top quality people, but they didn't have enough understanding of the Australian context."*

Another interviewee who felt the leadership program could be tailored better for the Australian context also noted other benefits:

> *"the content was good, it was a bit overly-British … But the people themselves were very capable and had a good understanding of the Australian context. And so I enjoyed that and I thought that because of the way that it was made up of people across the different LHNs and SAAS and MedStar and so forth, that actually that provided an opportunity to develop relationships outside of your…so I think that was a very valuable on a lot of levels."*

Interviewees drew on the importance of leadership for the success of their projects and could see where a lack of leadership had jeopardised projects. One project manager noted that for the clinicians they were working with 'they're both natural leaders'. The value of a medical clinician and a nurse clinician working together as leads was also noted in relation to staff engagement. Leadership was also evident in managing the groups of experts around the table:

> *"I guess what I find they're really good at and within a discussion, …at the expert working group because we had an expert working group in all of this, but also at the meetings of that [Clinical Group] where there was sort of conflicting views they were really good at sort of teasing out what the issues were and sort of if they couldn't come up with something at least putting together some sort of plan on how to get an outcome. So yeah, whether both parties fully agreed or not, they at least agreed to the process to come up with the outcome. So they were really good at that."*

There were other examples such as where a clinician expressed concerns about the limits of what each hospital would be able to do in a specific pathway, the clinical leads and the project manager explained how each hospital would still work within their capability framework. This highlighted the need to make this more explicit in the framework, to avoid similar concerns from other clinicians. One interviewee noted a concern from some clinicians that they were 'being dictated to in terms of what they can and can't do'. Effective communication and conflict resolution skills were not surprisingly valued in the clinicians that the project managers worked with:

"I know there's one member of the [name of group] who sees everything not as an attack, but questions why things are changing – which isn't a bad thing, but it's usually from the view of they're not doing this for the right reason. And whether that person just had the wrong, whether their impression of Transforming Health was that it was just the money saving…and I think [name of clinician]'s actually been really good at managing that. So he won't shut down the person when they're talking, but he'll sort of, he'll add in other things; so alright it might be that they're trying to save money but will that not also improve clinical outcomes … And that seems to have worked quite well with that person."

Communication was a regular theme in the interviews and linked to the project managers having broad expertise. One interviewee noted:

"We always had a communication plan for each of my projects which was all good and well that I can execute my state wide communication plan which essentially only really deals with public communications. Each of the LHNs were responsible for actually doing their own LHN communication plans …and I think the importance of those LHN communication plans with the staff were probably undervalued and not engaged. While we did consultation at a state wide level with our reps, we then assumed that the people on the ground within the LHNs were consulting with their networks. So, again, that assumption may have been a gap in communications that perhaps we should have, in hindsight said, well as your responsibility as a member sitting on this expert working group your responsibility is to make sure you engage and consult with all of your networks as well – because how am I supposed to engage individually with 25,000 employees or however many there is."

Another comment related to the lack of internal and external promotion of the great work that people felt they had done. Communication also related to broader engagement than specific specialty groups and examples such as MedStar and Emergency Department staff were cited as key to project success or failure. This also related to clarity on the scope of collaboration and engagement that was expected:

"you pick one of the earlier models of care how they've come together to come up with a, you know, an agreed statewide position on what the model of care is and then go to actually implement that across the network and get the involvement of even parties that are outside the original scope of Transforming Health in ambulance and country and so you know, …they've gone and been able to get those, get the agreement, get them implemented and challenge the way they operate and now move forward to even think about how they can do things better from that point of view."

One interviewee felt it had been easier to engage nursing staff more than allied health staff. They reported 'ambit' claims about the need for specific levels of FTE for specific allied health professions and limited or no evidence to link to better patient care. Some project managers noted the importance of being sensitive to local hospital politics in ensuring effective staff engagement:

"I know the clinical leads were concerned and I think it came out a bit in the thing that there was that concern that we were going to …So that's what we were really careful about and the presentation we had at the start of the workshop it was explicitly said that that's not what we're doing, that's not in our agreement and politically would've been disastrous if we considered doing it anyway. So we identified that as that's what people were thinking just because there is that rivalry …I guess and it's about this trust between different areas. And I put that down to communication again, the distrust may be because there hasn't been that communication previously".

Another issue relating to the operational capacity was the location of the project managers in that they were not co-located for the duration of Transforming Health. This appears to have impacted on their ability for engaging with each other and maximising their potential. To an extent the lack of co-location was compounded by staff turnover, largely for project managers and to some extent for clinical leads. One interviewee attributed the project manager turnover to not being treated well and not respected for their abilities. There was a suggestion that some project managers had left because they found the silo approach to working difficult. It was a challenge when project managers joined a project part way through and had to start building relationships. Whilst there were opportunities for project managers to collaborate, it appeared that the environment was not always conducive to a sharing approach. This seems to have matured somewhat, especially where project managers are co-located in a LHN:

> *"We share our little wins that we've had –we now have that capacity and network to share amongst us – and use those lessons learned both in a formal and informal way that we didn't do before."*

The relationship between the project manager and the clinical lead was highlighted as very important by several interviewees. One interviewee contrasted the value of being in an LHN and so having easier access to the clinical leads. Another interviewee reflected on the importance of the project manager role and the specific skills they brought such as communication and project management. Project managers were seen as important so that clinicians could focus on what needed to be done to provide the best possible care. The clinical lead role was seen as particular crucial in the development phase and less so in the implementation phase where a project board was established. One interviewee reflected on the 'underestimation about how much time they [clinicians] would need to put aside for some of these projects'. It was also noted that for the project board, the right people had to be part of it. Some noted initiatives that would ensure a better approach going forwards:

> *"So we've actually set up another sort of group which is just the project managers but also some people from PDSO and rather than having sort of a formal meeting structure, this is more the sort of workshop ideas and people who might have issues to be able to go through them…but that's only a very new thing and I guess within the project management side of things … in an ad hoc sort of way we've had a few projects where someone's getting ready for a workshop and just ask all the project managers for whoever is willing to just come and help them sort of brainstorm a few things and I think that's worked quite well as well."*

Before Transforming Health was being implemented, there were various governance structures in place that could have supported staff engagement, such as the Clinical Networks and Clinical Senate. The Surgical Advisory Committee was noted by some interviewees and the value of the leadership of this committee is an importance consideration. There were several comments about the work the Clinical Networks were doing and their interdisciplinary nature. One interviewee noted how some of the value of the clinical networks was lost as when the clinical groups formed under Transforming Health they had to focus only on metropolitan settings and yet the clinical network model had led to a much more inclusive approach with country providers and clinicians. Another respondent noted:

> *"So that transition away from clinical networks as a clinician engagement tool was really all around resource availability and not necessarily around a coherent sort of implementable strategy over a period of years. …So I think the general focus on operational outcomes, system capacity and then the consequences of the physical reconfiguration certainly have had an impact on both clinician behaviour and system output, there's no question about that. There's been big kind of Hawthorne Effect which I think's been positive. But I think in terms of clinician engagement, I think Transforming Health's probably made it worse rather than better because there was so much ambiguity in the process. And because we never measured clinician engagement properly at any point…So the effective ones [clinical networks] have found a way to keep going."*

One interviewee felt that the clinical networks were 'teams of like-minded people in that specialty area working in their own silo'. Where relationships had already been in place, e.g. for statewide committees, the engagement across clinicians was naturally easier to harness.

"So it was, so I think in some ways the [NAME] group actually worked extremely well from a TH point of view and part of the reason it worked extremely well because it was actually very easy because as I said a lot of things had lined up in the background to make it easy."

The amount of trust people had in the system was also raised in relation to staff engagement:

"I think that the goal there would have been for Transforming Health to change the level of trust in the system, so that subsequent decisions will be made with a higher level of trust, and I think it's not done that. So by removing the clinical networks, not measuring clinician engagement and not being transparent about it, by focusing overly on money and buildings, I think actually it has reduced the level of trust in the system, not increased it."

For others, Transforming Health was 'an opportunity or a vehicle they could just hop onto' to get engagement happening. Some dissatisfaction was expressed about the way the process was managed:

"And there was a very poor process, they just said, "The Clinical Networks are ceasing to be and you can work in Transforming Health."

The scope and methodology for the work project managers had to undertake was reported as being ill-defined and at times confusing. One example given was whether the project teams had to undertake financial costings for their proposals and to what extent they had to focus on implementation.

"I think too many processes changed …the red tape paperwork of "This template has to be used, no you have to do a business case now, you have to do this now." I've found it excruciating. I try not to bother the clinicians with that because they just think more red tape"

"So in fact one of the mistakes …a direction was that we weren't to consider the finance …They said develop the model, get it to best model and then we'll worry about the dollars afterwards. And of course …when we developed the gold plated model as they instructed they say …we can't afford this; you guys need to go and think about it again. In terms of money it's like yeah, I would've liked to do that from the beginning, but – and I think that philosophy has slighted changed in terms of they're getting the business side into it much earlier on when they're developing models now which is clearly the way to do it."

Project scope also needed to be clear to ensure engagement was effective:

"it wasn't clear from the outset what the deliverable was, it was – it became just a big talk fest with too many stakeholders, there was millions of external stakeholders, …all of whom wanted their issues addressed which were important, but were not necessarily the core issues that SA Health could control."

Governance processes seemed to have been more of a hindrance at times for project managers rather than providing structure and guidance:

"I think the biggest thing that I have struggled with, with all of these processes has been the internal processes within this building that we have to go through in regards to what are the governance processes, what are the project processes …I would get to a point and then the governance committee would go, oh, well, actually you need to now do this step. So, I found personally I had to be very resilient in the sense that I was chasing a snowball down a hill trying to catch up and the snowball kept moving. So, trying to then articulate what I needed to do to the clinicians who then saw it as red tape and another hurdle … Once we had the model of care approved, we would have then thought it would then go to the LHNs to be implemented and then my project was finished…You actually need to do a financial costing of it, you need to go through and do a business case for why the project is actually valid even though from the starting point we were told you don't need to do any financial costing. It's already been done as a part of the Transforming Health business case – just go off and do it. It's not about cost, it's about patient centred care. So, when I got to the end of it I then had to go back at … from a project perspective should have been done at the very beginning."

This frustration was attributed to an extent to separating service design and implementation phases and the need to engage with a much broader stakeholder group at the implementation phase and have the implementation goals defined at the start.

4.3 Authorising Environment

This aspect relates to having the ability to legitimately authorise actions, collaboratively with stakeholders and all those whose support is necessary to sustain the goals of Transforming Health. The link with the authorising environment and the governance, particularly relating to project management, was a key theme to emerge. Interviewees provided descriptions ranging from governance being unclear and lacking scope, to a turnover of staff and lack of clarity on where authority was held. These concerns were often tempered with the resilience of the project managers of the leadership of specific clinicians:

> *"…but having said that the key things have been implemented, the things that needed to be implemented at each local LHN have been implemented, it's just the stuff where we've all needed to come together to make decisions or whatever has sort of fallen over a little bit because either we haven't been able to get agreement or because there's been that postponement in terms of the governance".*

Interviewees also reflected on situations where clinicians had decided to be no longer engaged with a project:

> *"there was a decision made about ongoing governance for [clinical project] and it ruffled a few feathers because people didn't get what they wanted and because of that … they withdrew some of their commitment to the project. …I think that's more an issue you have to work around because that's just the way it is"*

The concept of staff engagement and the sustainability of their reform were inextricably linked to challenges of governance for several interviewees:

> *"we are sort of looking at an ongoing governance structure; it wasn't one of the deliverables for the project, but since we need to extend the project anyway because it's gone past the base line we're going to add that into the scope of the project or that's the proposal at this point.… So I think that's an important consideration …about making sure that evaluations are sort of considered right at the start"*

Engagement was also linked to the role of the Department of Health and that of each Local Health Network. One interviewee summed up:

> *"I mean at the end of the day I think what I see are a lot of people who don't understand clinician engagement very well, and nobody really taking responsibility for it, either at a SA Health level or an LHN level. And I think the LHNs are different and the disciplines are different …it needs to be a considered and appropriate response and to be honest, I think we're better off just doing it at an LHN level… and the engagement has to align with the clinical service delivery, …structures, …So I don't really feel like it should be the Department's problem."*

The Transforming Health program of reform had in some people's opinion provided legitimacy and an authorising environment that had previously been absent. Interviewees noted:

> *"the timing of transforming health definitely helped us in terms of being able to drive change which I think in another environment would've been very very difficult."*
>
> *" so all of these are things that lined up but you needed that ignition right, so transforming health probably helped ignite what was there already, so that's kind of why it's kind of just taken off and gone through"*
>
> *"…. it gave us permission to form these groups of individuals across multiple disciplines to say, well, we can get it done, we must get it done, how are we going to go about this?"*
>
> *"…the model gave us the structure of what needs to happen and there's been champions in the individual departments but they're all working in a coordinated way because they're getting together as this implementation team at defined points in time which wasn't happening before."*
>
> *"… because you're bringing the people together in a team – and these are people who – 12 months earlier, they wouldn't have known each other from a bar of soap … but then by having this multidisciplinary, multispecialty sort of implementation …when it comes to it, we're able to link in the [specialists] and actually get everyone doing the same thing at the same time instead of one group trying to do the best thing and being disillusioned by it because everyone else is doing something else … which is what happened previously."*
>
> *"I don't think that would have happened without Transforming Health, so I think that that system reconfiguration, you know, changing ambulance flows, sorting out radiology issues… I think if there wasn't a multidisciplinary group that endorsed that plan, then I think the…and the CEOs of the LHNs would never have had the confidence to commit, nor would the Department have had the confidence to stand behind those clinical decision makers or executives in the LHNs."*

The discussions around legitimacy and agency also raised concerns about what would happen 'post Transforming Health'. One interviewee noted:

> *"….– you know, we all agree there's a problem, what can we do about it and moving forward on that whether there's a clinical need you know clinical outcome or conversely looking at where in certain areas there might be existing pockets of excellence picking up those pockets of excellence and trying to propagate them throughout the network you know, in a similar way.*
>
> *"– I think that's a significant risk is the – because it's all driven by clinical good will or good will by people on the ground that if you're not going to get those senior clinicians, or senior doctors or senior nurses, if they're not going to buy in, it's not going to happen in the environment that we're in"*

An important counterpoint to the themes around authorising environment and a sense of agency that Transforming Health brought, were comments around accountability in parts of the health system.

"If I go and question the methodology and I have people going back and re-prosecuting the case and ...I don't have to deliver because I'm not going to be held to account … it's not as easy to hold to me to account if I'm questioning over here rather than actually worrying about this.…it's usually only the same three people in a LHN that are going to get fired for non-performance. The CEO, the COO or the CFO .It's not going to be head of ED or the head of medicine or whatever, so what are we doing to actually make sure that there's also accountability down at that structure across there to say okay, head of ED if you don't deliver your budget, you're gone? …If there's not accountability, if there's no accountability structure and no consequences low enough down in the organisation how are you going to change behaviour?

…you could have the best governance in the world but if you don't have the right mechanisms to hold people to account …you're not going to change behaviour …There's pockets of massive sandpits around here populated with ostriches, 'let's just put our heads in the sand and eventually it'll blow over', we can pop our heads back up and just resume what's going on."

"… the dashboard helps right, because we can directly compare results between the LHNs, so as long as you've got a few key people in each LHN who periodically look at the dashboard then that becomes a regular part of performance, then invariably …whoever's monitoring your performance at whatever level is going to say well hang on a second, why is [NAME] doing so much better than you? And that's now so visible and public, so I think that increases the chance of things succeeding."

The industrial relations environment was also raised as a hindrance to change and accountability:

"You look at some of the failings …the non-delivery of the projects, the non-delivery of the plans, the benefits attached to those, the continual delaying and recasting …is there sufficient accountability low enough down in the organisation for these changes to propagate all the way through and then you could come back to the stock standard one of the biggest challenge of this was always going to be the industrial environment and that wasn't either tackled early enough head on or health wasn't given sufficient custodianship of the mechanisms that needed to be changed. So in a lot of cases the industrial mechanisms were just rolled over or you know renewed for another three four five years without much change to get the leverages that we needed so realistically it's now another three four five years before we can do anything because what is already a highly industrialised environment… That's one way to look at it from a service reconfiguration point of view, but from a dollars point of view it's never going to succeed because of the fact that we can't have those hard conversations where we need to."

"… which wasn't the intent of the initial model and obviously there's some industrial stuff going on there which arguably stops the two hospitals working together as well as they could."

One interviewee contrasted the legitimacy given to work done for Transforming Health with other initiatives to promote collaboration:

"Getting buy in from the executive which didn't happen with the clinical networks, so the executive in the Department of Health weren't really engaged in implementing what came out of the clinical networks whereas now you've got to have that executive buy in to be able to move forward with your project, so that's been helpful."

Another reporting that the changes at Executive level in the Health Department meant that there was limited engagement at the highest levels with the proposals relating to Transforming Health.

4.4 Role of MCAG and committees

The role of MCAG and communication channels was noted. Some interviewees highlighted their concerns about clarity or effectiveness of governance:

> *"But I think the problem with it I guess was how it interfaced with MCAG, so if MCAG was where all the decisions were being made, …but there wasn't a lot coming down from MCAG and now that we're sort of reviewing MCAG a lot of work's actually started to filter down, but that's also from other areas within Transforming Health. So I guess if we're going to set up these governing bodies, it's making sure they, how they fit into the world is set up properly."*

> *"…but it [MCAG] wasn't in any way a decision-making body, it was a consultation sort of you know, group. And then there were individuals in the group who took ownership of specific projects and I think there were only really three or four that actually were sufficiently mature to implement …I think there were aspects that were really positive and aspects of it which didn't work very well. But at the end of the day I think it wasn't an executive decision-making group. It made recommendations, those recommendations then went to THIC and THOC …the COO and the CEO groups which obviously had executive from the Department on. And then those groups actually were the decision making groups because they were the groups that were then going to align resources and system commitment, or reconfiguration to either accommodate or align with a particular model of care or clinical intervention."*

There were opportunities for staff engagement that interviewees commented on:

> *"The Directors Forum was sort of supposed to be a forum that sat underneath MCAG where all the clinical directors would come together. And it didn't quite work, so it was almost mimicking what used to be the Clinical Senate.… it turned out to just be an information exchange and even with that a lot of the information was already out there in other sources.*

> *" I mean the actual process of TH worked quite well, so I think somewhat to my surprise the poster walks and stuff actually seemed to be really well received and I was constantly impressed by how many people turned up to those sessions; to have hundreds of people there and then you talk to people afterwards and they did feel that they had genuinely been engaged through that process."*

The approach from MCAG of broad engagement for the clinical projects was discussed, particularly in relation to the workshops. The workshop format was seen as an extra benefit that the clinical networks had not used, and it allowed broader consultation and engagement. One interviewee noted that the groups were still 'medical dominated'. The value of engaging younger clinicians was recognised:

> *"But some of them are really good with getting up-coming younger consultants in, not just the old Head of Unit. And I thought that was a very good part of the engagement because they will lead the reform in the next, with support of the clinical leads and the Heads of Unit, but they are going to be the next generation leading the reforms."*

Project managers also played a role in getting people involved. One interviewee noted:

"…the structure of the workshops, it was very open forum. Previously working within SA Health, people would get tapped on the shoulder and asked to come in and be involved with the projects whereas this – Dorothy sent out an invitation to the big, wide world that said come to this workshop.…and at that workshop anybody could have their say and it was all anonymous on boards so it was completely transparent from all – Allied Health, nursing, medical, administrative, and consumers were all there and from there we actually put out an expression of interest of anybody who wanted to be involved with the development. So, we actually said, who wants to be involved not do you want to be involved?... we really made sure that we kind of distributed people kind of evenly when we had the invitation list came back we made sure that there was a pretty even rep between the three disciplines which – and if there wasn't we would have addressed it…"

The workshop style approach was described as non-traditional and forced collaboration and enable facilitators to ask questions of participants. This was then complimented by an approach that engaged disciplines in the pilot projects. Nursing and medical staff worked alongside each other and separate approaches were taken when the discipline needed to consider what it meant for their area, e.g. allied health. One interviewee was more sceptical about the workshop format:

> *"The workshop, the workshops were different, but I think sometimes the wrong, they've changed along the way because from my, my impression of what's happened, the workshops were originally you got the data up there and said, "Da, da, da this is happening"…and you tell us what you think is the problem. But they morphed into, "We're telling you the problem, we think this is the fix, what do you think?" So it was a different engagement"*

4.5 Change management and next steps

Change management emerged as a separate theme although links to the operational capacity issues set out above:

> *"I just think that people don't deal with change and I think a lot of the resistance that we have had on the ground has been change overload and probably lack of communication and transparency to what was actually happening because I felt that myself. We were given a project from a business case that needed to go forth and do it, but we were never allowed to see the business case so we were doing changes which we couldn't even validate what the changes were be because it was an 'in-confidence' business case. ….. So you would then have a clinician say, well, where's the data that validates why you're doing this and we couldn't – we couldn't do it. We didn't have it."*
>
> *"If it was going to be done again I think in that size,…is trying to communicate early enough the message of what needs to be done and the methodology that underpins it … so I think it's trying to prosecute more strongly the case for change …"*

Interviewees appeared to see the interview as a chance to reflect on the next steps for Transforming Health, their roles and the sustainability of any staff engagement:

> *"… it probably depends on what business as usual becomes post Transforming Health. I don't think Transforming Health, if we go back to how we did things before then it made no change in terms of that, so we may have improved clinical outcomes, we may have had a few savings but I don't think it would have changed culture or engagement at all. Yeah, so I guess it's how we structure things going forward and in particular clinical engagement I guess. Yeah, I guess it's getting the department and the LHNs to play well together."*
>
> *"I think on the downside at the moment is we still haven't put our structure together, so there's a lot of things up in the air and within the department itself the transforming of divisions obviously are going to have to change at some point, we're restructuring as well."*

It seemed useful to have some form of formal networking for the project managers, particularly given than many will be working out in LHNs:

"we need to actually have a network of all of us meeting together. There needs to be a forum whether it'll only be a quarterly meeting, that everyone gets together so that we know that we're all on the same page working with … areas because they have a lot of work that they're doing that crosses over with the work that we're doing – so that we're all singing from the same songbook"

The challenges with governance and the sense that 'goal posts were moved' also led to reflection on the next steps. One interviewee noted that the PDSO had set up a project lifestyle framework to be used in future, and that this approach would have given valuable structure and definition to the earlier projects. The long term plans for some project officers and the responsibilities of the LHNs seemed unclear at times:

" what is the role of the LHN in ensuring that it is actually happening … and a part of that will be a benefits realisation process …reassess each of the LHNs so they can come back and actually reassess where they're sitting at – are they actually still meeting all of the criteria to align with the model or have they gone back into old habits and doing what they shouldn't be doing? So, it would be a regular review process to make sure they're still actually doing what they're supposed to be doing to meet the model of care."

"I'm not quite sure what the project support ongoing is right, because we've kind of dissolved the central group, we're not meeting anymore …it's something that needs discussion before MCAG dissolves in a month or so, is that me or someone like me should probably stay as the notional contact point for the [PROJECT NAME] in South Australia with a designated project support in the department which won't be very much work, but I think we still probably need that kind of contact point…also if things change right, so if something changes and we need to change the model … you can fairly quickly just say well look, no that's fine, I know who the key people are in each LHN, there's a project officer in the city who can coordinate pulling everyone together in a meeting in the city and we can work out what the next step is… what is the governance body now to make sure that this project stays on track from a state wide point of view? …It doesn't need to be much, but it does need to be something."

Some interviewees reflected on the challenge going forward and potential loss of impetus that Transforming Health had provided:

"I still see them going well at this stage but it's as long as that impetus and that momentum are maintained from that aspect. I think the biggest threat to those pockets is probably the abrupt way in which Transforming Health was ended and the announcements that came around that and how some people have been left perceiving as vulnerable … are no longer supported by government particularly, from that point of view so I think that's probably one of the biggest challenges from that aspect is that some of those, some of those pockets of resistance that we're all familiar with, whether they are emboldened by that to try and unravel some of the stuff that's gone on. …I've seen a lot of, a lot of collaboration between different stakeholder groups, consumers, clinicians, finance and others to come up with those agreed statewide models of care and then looking to try and implement those and there's been different challenges along the way …but you can kind of see those things going in the right direct under this process."

One clinician noted the importance of this process contributing to capacity building and the value of handing over the leadership and implementation to more junior consultants. The need for ongoing support was raised by others in relation to sustainability of the changes and the processes in place:

"Well, I think if they [project managers] have come to the end of their roles then we've – then we've come to the end of our changes and a healthcare system needs to grow, needs to change …it needs to evolve with the – with time, technology and new ways of doing things - and to remain exactly the same, well that's the situation that we were in for 20 years. We didn't evolve. We didn't change how we did business …What we really needed was a re-evaluation of how we do our day to day business and this has given us a big kick start to that but we need to continue doing that and carry on that program –and continue in that quality improvement cycle which – if we don't have someone to facilitate that, if we don't have a change manager, project officer, it's just not going to happen. We'll just go back to the old ways."

This concern about sustainability was a theme in several of the interviews:

"I think some of it is just really deeply engrained you know cultural beliefs or beliefs that you know we've been through this before it's not going to change they always sort of come back to our way or they always you know, the change never happens or the change is never sustained or it doesn't deliver the outcomes that it's supposed to deliver …so we're gone through this entire exercise to save all of this money and haven't saved anything so why did we go through? We'll just go back to the way that we're operating in terms of managing budgets, managing funding allocations etc."

5. Discussion

This evaluation using a series of interviews with people involved in various ways in Transforming Health has yielded some valuable insights into their experiences. There are limitations in extrapolating the data presented above, given only 13 people were interviewed and there was no intention to stratify participants by e.g. Local Health Network. The interviewers are SA Health employees and that could have in some way biased the reporting of perceptions. Given those caveats, it was impressive how interviewees gave their time, often more than an hour of discussion, to frankly share their insights and perspectives.

Some themes began to emerge in the interviews early on and remained consistent and by the final interview there were limited new data emerging. Participants drew on their own situations, mandates, workstyles and values to give context to the insights they provided. Thematic analysis even at the initial stage highlighted a link between interviewee perceptions and the 'Strategic Triangle' presented by Mark Moore (Moore M, 1995). A further analysis of the transcripts by the authors confirmed that the strategic triangle provided a good foundation for reflecting on the concepts in the data, along with the extra themes relating to the role of the Ministerial Clinical Advisory Group and change management.

These themes, and the quotes present above as illustrative of these themes, could form the basis of recommendations for how health reform could be approached in the future, particularly in relation to staff engagement. Core concepts such as transparency around rationale, in this instance the 'business case for Transforming Health', establishing clear governance that empowered those at the local level to lead and implement projects, and clarity on the scope of decision making, e.g. whether funding had to be a consideration, are a few of the important 'take home messages' from this evaluation. The similarity in views across clinical leads and project managers for the barriers and enablers to reform was interesting. On the other hand, there were some projects that were clearly going to progress without the impetus of Transforming Health and others where Transforming Health provided that authorising environment to create urgency.

Given that this evaluation started from the premise that staff engagement was a concept to be explored, it was interesting to note the difficulty in getting the interviewees to remain focused on that aspect rather than the strategic management of Transforming Health overall. In the absence of any baseline data, other than staff satisfaction surveys, there are limited conclusions to be made on the impact of Transforming Health on staff engagement. There are interesting quotes and insights, particularly from clinical leads, about the need to 'get people together in the room' and how the Transforming Health agenda may have enabled this. An ongoing concern is whether any initiatives are sustainable beyond the urgency and mandate created by Transforming Health, and the project managers often provided useful insights into how future governance structures and resourcing could facilitate broader cross disciplinary, cross specialty or cross Local Health Network collaboration.

6. Summary

This small scale evaluation could form the basis of recommendations for those in leadership roles in the Local Health Networks, statewide services and the Department of Health centrally, relating to resourcing and governance for any future reform. There is a clearly a strong affiliation among staff in the Local Health Networks to their Local Health Network and this largely overrides any sense of belonging to SA Health as a statewide entity. This warrants further exploration and specific recommendations to understand the barriers and enablers to staff engagement at a deeper level.

This report will form the basis of the work done by the Transforming Health Evaluation Working Group and will link in with the data generated from the themes that other members worked on. The SA Academic Health and Translation Centre is overseeing this work and it will be left with them to ascertain next steps.

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10.3.4 Clinical Outcomes

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1. Executive Summary

The aims of this study were to assess the effects of Transforming Health on the quality, consistency and cost of health care across metropolitan hospitals. Care pathways for Acute Coronary Syndrome (ACS) Emergency Department Pathway and Stroke were selected as case studies because these were the clinical areas in which new models of care were implemented earliest, and for which data can be analysed to estimate the early effects of the changes.

Data were extracted from centralised data systems held by SA Health for patients presenting at a South Australian metropolitan public hospital from January 2015 to June 2017, who met defined eligibility criteria for the two clinical areas. Outcomes variables included mortality and hospital admissions within 30 and 90 days of an index presentation, average length of stay (LoS) and average costs. Proportions of patients admitted after an ED presentation was analysed for ACS patients also.

A relatively new method – Covariate Balancing Propensity Scores (CBPS) (1) – was used to control for differences in baseline characteristics between patients presenting at different hospitals and at different time points. The analyses adjusted for differences in age, sex, socio-economic status, indigenous status, after-hours presentation and a range of comorbidities.

For ACS presentations, statistically significant reductions in mortality at 30 days and 90 days were observed in the first quarter of 2017 compared to the first quarter of 2015, building on a non-statistically significant improvement in the first quarter of 2016. There were significant increases in the number of presenting patients admitted from the Emergency Department (ED) also. There were no other statistically significant differences in the other outcomes, though average LoS decreased slightly in 2017.

For Stroke, non-statistically significant increases in mortality and readmissions were observed in 2016, but these outcomes returned to levels similar to 2015 in the first quarter of 2017. Length of stay showed a downward trend, building to a statistically significant reduction by 2017. Separation costs remained similar across all three time periods.

There was some indication of reduced variation in outcomes for ACS and Stroke patients between hospitals over time, though the numbers of stroke patients presenting at individual hospitals provided little power to detect real differences.

The reported results capture the early effects of the new models of care implemented as a result of the Transforming Health initiative, and indicate movement in the right direction. Regular updates of the reported analyses, across a wide range of clinical areas will better represent the effects of Transforming Health and inform further, continuing improvements in the South Australian health system.

2. Background

The aim of the Clinical Outcomes Theme was to assess the extent to which Transforming Health delivered consistent high quality health care across all metropolitan hospitals, potentially providing better value at decreased costs. The focus of the evaluation was on the effects of the working groups set up to define and implement new clinical models of care.

Nine different clinical working groups were established. Implementation of the defined models of care is ongoing in many cases. The first four clinical working groups developed new models of care; Acute Coronary Syndrome (ACS) Emergency Department pathway, Stroke, Rehabilitation Services and Orthogeriatric-Acute Hip Fracture. Analyses to date have focused on the stroke and ACS models of care because these were the clinical areas in which the new models were implemented earliest.

To evaluate improvements in the selected clinical areas, the following three questions were specified:

- Have National and International clinical benchmarks been met?
- Have the new clinical models of care resulted in improvements in clinical outcomes and higher value health care?
- Have the new clinical models of care reduced unwarranted variation in the quality of care provided to patients across the State?

Our analyses aim to answer the second and third of these questions.

Routinely collected health systems data were used to assess improvements in patient outcomes and health service costs, and on variation in care received by similar patients in different places. Risk-adjusted cost-effectiveness (RAC-E) is a method of analysis that uses routinely collected data to compare health care costs, outcomes, and processes of care, incorporating multivariate methods that adjust for confounding to ensure that the characteristics of comparison groups are as similar as possible. RAC-E analyses can provide a useful tool to compare performance across different providers or different time periods. Similar methods have been applied to the study of hospital processes across settings (Timbie JW, Newhouse JP, Rosenthal MB, Normand S-LT, 2008; Schreyögg J, Stargardt T, Tiemann O, 2011) and the RAC-E methodology has been applied to SA data in previous comparative analyses of hospitals in the provision of services for chest pain (Karnon J, Caffrey O, Pham C, Grieve R, Ben-Tovim D, Hakendorf P, et al, 2013) and stroke (Pham C, Caffrey O, Ben-Tovim D, Hakendorf P, Crotty M, Karnon J, 2012).

3. Methods

Data were extracted from centralised data systems held by SA Health for patients, aged 18 years and over, who met the following eligibility criteria for the two clinical areas:

- Acute Coronary Syndrome (ACS) Emergency Department Pathway: Diagnosis in the emergency department (ED) of either unstable angina (International Classifications of Diseases (ICD)-10 code I20), myocardial infarction (MI: ICD-10 code I21), or unspecified chest pain (R074).
- Stroke: Inpatient separations with an AR-DRG code of B70.

The extracted administrative data described eligible ACS ED presentations and data on all separations at South Australian public hospitals for the ACS and stroke cohorts, including more detailed resource use and cost data on index ACS and stroke separations (i.e. the first ACS or stroke event within each analysed time period for individual patients). Data were extracted for all patients with an index event presenting at a South Australian metropolitan public hospital between January 1 2015 and June 30 2017.

Outcomes of interest were specified as mortality and admissions potentially related to the index event within 30 days and within 90 days of the original index presentation, differences in total cost, average length of stay (LoS) and the proportions of patients admitted from ED (for the ACS analyses).

Admissions potentially related to the index event for the ACS cohort were defined as subsequent admissions with ICD-10 code I20, I21 or R074. Potentially related admissions for the stroke cohort included a new admission for a stroke (AR-DRG B070) or a one of defined set of potentially related AR-DRGs. The numbers of new admissions by Major Diagnostic Category and the inclusion and exclusion criteria are presented in Appendix A.

Comorbidities for each patient were coded using the same methods reported by Queensland Health in their application of the Variable Adjusted Display Methodology (Centre CPI, Duckett S, 2008). These were coded on the basis of principal diagnoses and additional diagnoses recorded in ED or inpatient records for patients over the
12 months preceding an ACS or Stroke index event.

The extracted inpatient cost data for admitted patients included direct and non-direct costs for the ED component of all inpatient separations. Due to the absence of these costs for patients discharged without admission from ED, these two components of ED costs were omitted from the calculation of average index costs for the ACS patients.

Two broad sets of analyses were undertaken for both the ACS and Stroke cohorts.

Firstly, index events across all South Australian metropolitan public hospitals were aggregated in each of the first quarters (January 1 to March 31) of 2015, 2016 and 2017. Ninety-day outcomes were only available for Index events up to March 31, 2017.

The cohorts in each time period were analysed to compare each of the outcome variables across the time periods to analyse aggregate effects across metropolitan public hospitals over time.

Secondly, cohorts were compared on the basis of the hospital to which they presented in each of the first quarters of 2015, 2016 and 2017, i.e. outcomes for patients presenting at the four main public teaching hospitals were analysed by hospital in 2015, 2016 and 2017. These analyses were undertaken to test for changes in variation in outcomes across the four main public hospitals over time.

Such analyses are subject to bias, primarily due to potential differences in the characteristics of patients attending different hospitals or attending hospitals at different points in time.

Observed potential confounders for the chest pain cohort included age, sex, Socio-Economic Indexes for Areas (SEIFA) (in deciles, determined by postcodes of residence), chronic obstructive pulmonary disease (COPD), cancer, diabetes, indigenous status (three groups), after-hours (and including weekends), circulatory disease, renal disease, dementia, and for any related presentations (eg, R070 – R 074 or I200 – I219) recorded in the previous
12 months.

Observed potential confounders for the Stroke cohort included age, sex, SEIFA (in deciles, determined by postcodes of residence), chronic obstructive pulmonary disease (COPD), cancer, diabetes, indigenous status (three groups), after-hours (including weekends), proportion of patients transferred, proportion with circulatory disease, renal disease, dementia, and for any previous admissions for stroke (eg B70).

A SEIFA decile of relative socioeconomic advantage and disadvantage was mapped to postcodes for each patient's residential address. A three level factor was constructed to represent indigenous status as either Non-indigenous, Aboriginal or Torres Strait Islander, or unstated ethnicity.

While regression methods are often used to adjust for confounding, they require high accuracy in modelling the relationships between confounders and this can be particularly difficult when the rates of outcomes are low and the number of potential confounders is high. Nor do regression goodness of fit measures test whether systematic differences between treated and untreated subjects have been eliminated and regression methods have shown to increase bias when there are large differences between means and variances of the covariates between the groups (Rubin DB, Thomas N, 2000; Heckman JJ, Ichimura H, Todd PE, 1997; Cochran WG, Rubin DB, 1973).

Our analyses instead employed an alternative and relatively new method; the Covariate Balancing Propensity Score method (CBPS) (Imai K, Ratkovic M, 2014) to adjust for differences in baseline characteristics between patients in different hospitals or potential changes in patient characteristics over time in comparing post-discharge potentially related admissions and mortality outcomes. This method is based on work originally pioneered by Rosenbaum and Rubin (Rosenbaum PR, Rubin DB, 1983) and later extended to multiple groups by Imbens (Imbens GW, 2000), which control for confounding by incorporating the propensity score; the predicted probability of a group membership given measured confounders (Joffe MM, Rosenbaum PR, 1999; Robins JM, Hernan MA, Brumback B, 2000; Lu B, Zanutto E, Hornik R, Rosenbaum PR, 2001; Hirano K, Imbens GW, 2001; Imai K, Van Dyk DA, 2004; Rassen JA, Shelat AA, Franklin JM, Glynn RJ, Solomon DH, Schneeweiss S, 2013; Yang S, Imbens GW, Cui Z, Faries D, Kadziola Z, 2015). Propensity score methods facilitate the creation of groups with similar distributions of covariates. Outcome analysis is then conducted using the inverse of the estimated propensity scores for a group as sample weights (Imbens GW, 2001; Robins JM, Hernan MA, Brumback B, 2000), allowing an un-confounded comparison of observed outcomes between groups from a pre-balanced data set (Davis DA, Thomson M, Oxman AD, Haynes R, 1995).

The CBPS methodology, proposed by Imai and Ratkovic, (Imai K, Ratkovic M, 2014) uses an iterative computational procedure (Hansen LP, 1982; Owen AB, 2001) to select parameters which ensures mean independence is attained between treatment and covariates after propensity score weighting, while aiming to directly improve balance on all individual covariates between groups in the process. CBPS has been shown to produce robust estimates of group effect, improving the balance between covariates and reducing bias, even in situations where the propensity score is mis-specified or the set of confounders is incomplete (Imai K, Ratkovic M, 2014;, 22-24).

4. Results

Baseline patient characteristics and post-CBPS weighted patient characteristics for each group or time period are provided in Appendices B and C. Measures of standardised differences are also provided to show improvements in balance between group characteristics after the weighting process. CBPS improved the balance on all characteristics between groups.

4.1 ACS Results: Over time

Table 1 describes the following outcome variables for the ACS cohort:

- proportions of ACS patients who died within 30 and 90 days of their index ACS event;
- proportions of ACS patients who experienced a new ACS-related hospital admission within 30 and 90 days of their index ACS event;
- proportions of ACS patients who were admitted as an inpatient from ED;
- average length of stay (LoS) and hospital costs for ACS patients.

The second column describes the values for each of the outcome variables across all metropolitan hospitals in the first quarter of 2015.

The third and fourth columns represent the differences in the reported outcomes in the first quarters of 2016 and 2017 compared to the first quarter of 2015.

Differences are represented in the form of Odds ratios for the mortality and new admission outcomes (an odds ratio less than 1 implies a reduction in mortality or new admissions in 2016 or 2017 compared to 2015). Presented differences in average LoS and hospital costs represent absolute differences. Statistically significant differences are presented in bold (at a 0.05 significance level).

Table 1. Outcomes for ACS patients presenting at metropolitan hospitals, January to March, 2015-2017

Outcomes	Jan – Mar 15	Jan – Mar 16	Jan – Mar 17
	Proportion	OR (CI)	OR (CI)
Mortality 30d	0.008 (0.006, 0.011)	0.898 (0.559, 1.437)	**0.584 (0.338, 0.984)**
Mortality 90d	0.015 (0.012, 0.019)	0.846 (0.595, 1.200)	**0.533 (0.354, 0.791)**
New admissions 30d	0.057 (0.051, 0.065)	0.922 (0.774, 1.097)	0.977 (0.822, 1.160)
New admissions 90d	0.089 (0.081, 0.098)	0.982 (0.853, 1.131)	1.020 (0.887, 1.173)
Admitted from ED	0.397 (0.383, 0.412)	**1.120 (1.031, 1.217)**	**1.274 (1.173, 1.384)**
	Average	Difference (CI)	Difference (CI)
LOS (days)	2.58 (2.42, 2.74)	0.01 (-0.21, 0.22)	-0.13 (-0.34, 0.08)
Cost per admitted patient ($)	4757 (4391, 5122)	558 (-32, 1148)	152 (-432, 736)

Statistically significant reductions in mortality at 30 and 90 days were observed in the first quarter of 2017 compared to 2015, building on a non-statistically significant improvement in 2016.

The proportion of patients admitted from ED was statistically significantly higher in the first quarters for 2016 and 2017 compared to 2015.

While average costs increased between the first quarter in 2015 and the same period in 2016 and 2017, these increases were not statistically significantly. There was no difference in average length of stay over the period.

4.2 Stroke Patients: Over time

Table 2 reports baseline outcomes for stroke patients presenting at a metropolitan hospital in the first quarter of 2015 and differences in outcomes in the first quarters of 2016 and 2017 compared to 2015.

Table 2: Outcomes for stroke patients across metropolitan hospitals, January to March, 2015-2017

Outcomes	Jan – Mar 15	Jan – Mar 16	Jan – Mar 17
	Proportion	OR (CI)	OR (CI)
Mortality 30d	0.110 (0.083, 0.146)	1.128 (0.743, 1.714)	1.100 (0.723, 1.674)
Mortality 90d	0.126 (0.097, 0.163)	1.212 (0.820, 1.796)	1.059 (0.710, 1.582)
New admissions 30d	0.108 (0.081, 0.143)	1.422 (0.949, 2.145)	1.036 (0.674, 1.595)
New admissions 90d	0.131 (0.101, 0.168)	1.223 (0.830, 1.808)	1.110 (0.748, 1.650)
	Average	Difference (CI)	Difference (CI)
LoS (days)	7.07 (6.16, 7.89)	-0.561 (-1.59, 0.48)	**-1.05 (-2.09, -0.01)**
LoS (incl. transfers)	13.95 (12.03, 15.88)	-1.07 (-3.40, 1.25)	**-3.07 (-5.38, -0.74)**
Cost per patient ($)	10,433 (9,243, 11,624)	-138 (-1,834, 1,557)	-147 (-1,843, 1,548)

Non-statistically significant increases in mortality and related new admissions were observed in 2016, but these outcomes returned to levels similar to 2015 in the first quarter of 2017. Length of stay (including and excluding transfers) showed a downward trend over the time period, with a non-significant decline in 2016 building to a statistically significant reduction by 2017. Separation costs remained similar across all three time periods.

4.3 ACS: Variation between hospitals

Table 3 reports the results of analyses investigating differences between the four hospitals for the first quarter of each of three years 2015 to 2017. Hospital 1 is the benchmark hospital, for which mortality, related new admissions post discharge, patients admitted from ED, LoS and costs per patient are reported. Odds ratios and differences in mean values are reported for the other hospitals in relation to Hospital 1. Statistically significant differences are presented in bold (at a 0.05 significance level).

Table 3. Outcomes for ACS patients by hospitals, January to March, 2015 -2017

January – March 2015				
Outcomes	Hospital 1 Proportion	Hospital 2 OR (CI)	Hospital 3 OR (CI)	Hospital 4 OR (CI)
Mortality 30d	0.011 (0.006, 0.020)	0.478 (0.154,1.307)	0.752 (0.292, 1.861)	1.668 (0.793, 3.675)
Mortality 90d	0.015 (0.009, 0.025)	1.028 (0.500, 2.117)	1.019 (0.495, 2.102)	1.578 (0.830, 3.093)
New admissions 30d	0.029 (0.020, 0.042)	**1.826 (1.167, 2.909)**	1.057 (0.637, 1.759)	**2.228 (1.446, 3.508)**
New admissions 90d	0.055 (0.042, 0.072)	**1.691 (1.205, 2.392)**	1.035 (0.712, 1.507)	**1.788 (1.278, 2.522)**
Admitted from ED	0.489 (0.457, 0.521)	**0.625 (0.518, 0.754)**	**0.645 (0.534, 0.778)**	1.046 (0.868, 1.261)
	Average	Difference (CI)	Difference (CI)	Difference (CI)
LoS (days)	2.3 (2.05, 2.60)	-0.12 (-0.63, 0.38)	**1.06 (0.56, 1.56)**	0.45 (-0.02, 0.92)
Total Cost ($)	4023 (3291, 4756)	242.5 (-947,1432)	**2842 (1660, 4024)**	615 (-492, 1722)
January – March 2016				
Outcomes	Hospital 1 Proportion	Hospital 2 OR (CI)	Hospital 3 OR (CI)	Hospital 4 OR (CI)
Mortality 30d	0.008 (0.004, 0.016)	0.505(0.139, 1.574)	1.231 (0.489, 3.194)	0.631 (0.195, 1.859)
Mortality 90d	0.012 (0.007, 0.021)	0.500 (0.172, 1.303)	**2.126 (1.078, 4.434)**	0.627 (0.238, 1.554)
New admissions 30d	0.036 (0.026, 0.049)	**1.538 (1.005, 2.379)**	1.199 (0.765, 1.889)	1.728 (1.141, 2.654)
New admissions 90d	0.070 (0.056, 0.088)	1.243 (0.897, 1.727)	1.145 (0.829, 1.600)	**1.487 (1.085, 2.048)**
Admitted from ED	0.475 (0.444, 0.506)	**0.601 (0.501, 0.720)**	**0.691 (0.577, 0.827)**	**1.269 (1.061, 1.518)**
	Average	Difference (CI)	Difference (CI)	Difference (CI)
LoS (days)	2.25 (1.96, 2.53)	0.28 (-0.18, 0.73)	**1.17 (0.73, 1.60)**	-0.01 (-0.45, 0.43)
Total Cost ($)	4686 (3749, 5624)	**1456 (64, 2848)**	**3244 (1901, 4587)**	-983 (-2230, 264)

January – March 2017				
Outcomes	Hospital 1 Proportion	Hospital 2 OR (CI)	Hospital 3 OR (CI)	Hospital 4 OR (CI)
Mortality 30d	0.007 (0.003, 0.014)	0.566 (0.159, 1.770)	0.325 (0.062, 1.198)	0.298 (0.053, 1.134)
Mortality 90d	0.010 (0.005, 0.018)	0.660 (0.244, 1.676)	0.764 (0.299, 1.886)	0.906 (0.374, 2.168)
New admissions 30d	0.042 (0.032, 0.056)	1.185 (0.779, 1.810)	1.259 (0.833, 1.915)	1.159 (0.761, 1.774)
New admissions 90d	0.083 (0.067, 0.101)	0.981 (0.714, 1.348)	1.104 (0.810, 1.507)	0.997 (0.726, 1.368)
Admitted from ED	0.515 (0.485, 0.545)	0.532 (0.443, 0.637)	1.255 (1.049, 1.501)	1.474 (1.231, 1.766)
	Average	Difference (CI)	Difference (CI)	Difference (CI)
LoS (days)	2.11 (1.86, 2.37)	0.38 (-0.09, 0.85)	0.74 (0.32, 1.16)	0.39 (-0.02, 0.81)
Total Cost ($)	4477 (3628, 5327)	451 (-805, 1707)	**1174 (60, 2287)**	142 (-956, 1240)

A significant difference in the proportion of patients admitted from the ED persisted across the three time periods, with consistently lower rates of admission at Hospital 2. There were significantly lower rates at Hospital 3 compared to Hospital 1 in 2015 and 2016, but then significantly higher rates between these two hospitals in 2017. Hospital 4 admitted significantly higher proportions of patients in 2016 and 2017, compared to Hospital 1.

In January to March 2015, there were statistically significant differences in the proportions of patients experiencing new ACS-related admissions at Hospital 2 and Hospital 4, compared to Hospital 1. Hospital 3 reported a significantly higher average length of stay and average total cost than Hospital 1.

In January to March 2016, significant differences in mortality, new admissions, length of stay and costs were still apparent.

In the first quarter of 2017, less variation overall was evident between hospitals. Apart from the significant differences in proportions of patients admitted from the ED, the only statistically significant difference in outcomes was the higher average LoS and costs per patient at Hospital 3. The differences in length of stay and costs had decreased relative to 2016 and 2017.

4.4 Stroke Patients: Variation between hospitals

Table 4 shows the results of analyses comparing outcomes for stroke patients presenting at the four major teaching hospitals in the first quarters of 2015, 2016 and 2017.

Table 4: Outcomes for stroke patients by hospital, January to March quarters, 2015 -2017

January – March 2015				
Outcomes	Hospital 1 Proportion	Hospital 2 OR (CI)	Hospital 3 OR (CI)	Hospital 4 OR (CI)
Mortality 30d	0.101 (0.058, 0.170)	0.764 (0.282, 2.004)	1.062 (0.427, 2.655)	1.385 (0.588, 3.357)
Mortality 90d	0.118 (0.070, 0.190)	0.673 (0.268, 1.626)	0.907 (0.389, 2.102)	1.121 (0.500, 2.534)
New admissions 30d	0.118 (0.070, 0.190)	0.532 (0.171, 1.511)	1.203 (0.493, 2.987)	0.474 (0.145, 1.383)
New admissions 90d	0.126 (0.077, 0.200)	0.800 (0.305, 2.048)	1.429 (0.618, 3.401)	0.516 (0.169, 1.433)
	Average	Difference (CI)	Difference (CI)	Difference (CI)
LoS (days)	5.03 (4.07, 5.98)	**2.68 (0.11, 5.25)**	**3.27 (0.70, 5.85)**	**4.59 (2.02, 7.16)**
LoS (incl transfers)	13.34 (10.36, 16.31)	0.84 (-4.97, 6.65)	4.30 (-1.51, 10.10)	2.97 (-2.84, 8.77)
Cost per patient ($)	7605 (6040, 9170)	**5182 (1556, 8808)**	**5180 (1554, 8806)**	**4699 (1073, 8325)**
January – March 2016				
Outcomes	Hospital 1 Proportion	Hospital 2 OR (CI)	Hospital 3 OR (CI)	Hospital 4 OR (CI)
Mortality 30d	0.139 (0.090, 0.208)	1.147 (0.509, 2.611)	0.730 (0.294, 1.760)	1.178 (0.525, 2.673)
Mortality 90d	0.168 (0.114, 0.241)	1.482 (0.718, 3.118)	0.654 (0.275, 1.502)	1.291 (0.615, 2.744)
New admissions 30d	0.175 (0.120, 0.249)	1.472 (0.724, 3.043)	0.714 (0.314, 1.586)	0.470 (0.186, 1.113)
New admissions 90d	0.183 (0.126, 0.257)	1.392 (0.689, 2.853)	0.705 (0.314, 1.543)	0.560 (0.237, 1.267)
	Average	Difference (CI)	Difference (CI)	Difference (CI)
LoS (days)	4.78 (3.88, 5.68)	-0.32 (-2.06, 1.42)	**2.64 (0.90, 4.38)**	1.24 (-0.51, 2.98)
LoS (incl transfers)	11.09 (7.91, 14.27)	-4.42 (-8.83, -0.02)	2.28 (-2.12, 6.69)	-4.25 (-8.65, 0.16)
Cost per patient ($)	7570 (6002, 9137)	-1093 (-3872, 1686)	**4346 (1567, 7125)**	1018 (-1761, 3797)

January – March 2017				
Outcomes	Hospital 1 Proportion	Hospital 2 OR (CI)	Hospital 3 OR (CI)	Hospital 4 OR (CI)
Mortality 30d	0.099 (0.058, 0.165)	N/A	1.766 (0.822, 3.951)	**2.949 (1.449, 6.370)**
Mortality 90d	0.122 (0.076, 0.191)	N/A	1.473 (0.704, 3.160)	**2.716 (1.384, 5.584)**
New admissions 30d	0.084 (0.047, 0.146)	**4.668 (1.898, 13.32)**	**2.729 (1.045, 8.050)**	0.743 (0.195, 2.640)
New admissions 90d	0.115 (0.070, 0.182)	**3.582 (1.616, 8.641)**	2.246 (0.968, 5.572)	0.907 (0.325, 2.498)
	Average	Difference (CI)	Difference (CI)	Difference (CI)
LoS (days)	5.49 (4.28, 6.70)	0.84 (-1.08, 2.77)	-0.23 (-2.16, 1.69)	0.93 (-1.00, 2.85)
LoS (incl transfers)	9.63 (8.01, 12.93)	-2.06 (-5.53, 1.42)	1.35 (-2.13, 4.83)	0.53 (-2.94, 4.01)
Cost per patient ($)	9,549 (7,570, 11,696)	-993 (-4,041, 2,055)	785 (-2,264, 3,833)	-202 (-3,251, 2,846)

In January to March 2015, Hospital 2 reported the lowest mortality and new admission probabilities, though the differences with Hospital 1 did not reach statistical significance. Hospitals 2, 3 and 4 had statistically significantly increased length of stay for the index stroke separation compared to Hospital 1, though the statistical significance was lost when transfer separations were added to the length of stay. Average cost was significantly higher at Hospitals 2, 3 and 4 compared to Hospital 1, although these cost estimates are derived from only the index event, and do not include transfer costs, which may impact on these results.

In the first quarter of 2016, Hospital 3 reports the lowest probabilities of mortality and readmission, whilst length of stay and costs remain relatively high. Hospital 2 experienced a decline in performance with respect to mortality and readmissions, whilst length of stay and costs reduced.

Several results warrant comment in January to March 2017. Compared to Hospital 1, mortality was higher at hospitals 3 and 4, and the proportions of patients experiencing new admissions post-discharge were higher at Hospitals 2 and 3. The results at Hospitals 2 and 4 are informed by small numbers of events (13 and 61 stroke patients were treated at these hospitals, respectively). The results at Hospital 3 might be investigated further, though high levels of variation in outcomes between quarters is noted, e.g. 90 day new admissions at Hospital 1 reduced from 0.183 to 0.115 between the first quarters of 2015 and 2016.

Length of stay and cost differences between the hospitals are much reduced compared to 2015 and 2016.

5. Discussion

The aim of these analyses was to assess the extent to which the Transforming Health initiative was associated with improved health outcomes, increased efficiency and reduced variation in the provision of hospital services. While we analysed changes to outcomes over time and between hospitals, our results were more informative for the ACS clinical area, where our data covered the proposed implementation date for the new model of care. Many of the proposed changes in the new model of care for the Stroke presentations were not implemented within the time frame of the evaluation.

Table 5 Aggregate outcomes over time across Hospitals 1, 2, 3 & 4

Indicator	Acute Coronary Syndrome	Stroke
Mortality	Significant decrease by 2017	No change
New related admissions	No change	No change
Patients admitted from ED	Significant increase in 2016 & 2017	N/A
Mean Length of stay	No change	Significant decrease
Mean Cost per admitted patient	No change	No change

Table 6 Variation in outcomes between Hospitals 1, 2, 3 & 4

Indicator	Acute Coronary Syndrome	Stroke
Mortality	Some reduction in variation between 2016 and 2017	Increased variation (based on small numbers)
New related admissions	Important reductions in variation from 2015 to 2016 to 2017	Increased variation (based on small numbers)
Patients admitted from ED	Significant variation remains	N/A
Mean Length of stay	No significant reduction	Important reductions in variation in LoS for index stroke event
Mean Cost per admitted patient	Important reductions from 2016 to 2017	Important reductions from 2016 to 2017

Significant improvements in mortality outcomes at 30 days and 90 days were apparent for ACS patients

presenting in the metropolitan area from the first quarter of 2015 to the first quarter of 2017. There were also significant increases in the proportions of patients presenting at ED that were subsequently admitted.

For Stroke patients presenting in the metropolitan area, the only statistically significant result over the time period of analysis was an overall reduction in length of stay for both transferred and non-transferred patients.

There was a pattern of reduction in the amount of variation in outcomes between the four major metropolitan hospitals for ACS presentation from the first quarter of 2015 to the first quarter of 2017, although significant variation persisted between the proportions of patients admitted from ED between the four hospitals and the length of stay and cost per admitted patient for Hospital 3 compared to Hospital 1.

There was some reduction in variation in outcomes between hospitals for Stroke presentations from the first quarter of 2015 to the first quarter of 2017. Between hospital differences in LoS and costs per patient diminished significantly. Further investigation of the observed increase in variation in new admissions, especially between the larger Hospitals 1 and 3, may be warranted.

The CBPS weighting method used in our analyses ensure comparisons are between groups that are as similar as possible in terms of confounding factors. Given the reliance on real world data, this enables our estimates to control for variation in outcomes which may be explained by differences in characteristics of patients in the cohorts being compared both over time and between hospitals. Estimates of difference produced using this method are still dependent on an assumption that there is no unmeasured confounding present which has not been captured in the process. Nor do binary indicator comorbidity variables capture condition severity. These factors may still exert an influence hospital selection, maintaining some degree of selection bias in results.

The ongoing analyses of these available hospital data and regular updating of these results would help monitor outcomes and help investigation of improvements over time which may be attributed to changes to models of care in different clinical areas. The comparison of hospital outcomes using methods that control for differences in patient characteristics helps highlight best practice and variation between providers.

6. Conclusion

To conclude, our results show some indication that Transforming Health initiatives may be associated with improved health outcomes and a reduction in variation between providers of hospitals services in the metropolitan area. While our analyses are limited by the extent to which our available data covered the implementation of changes to models of care for these two groups (ACS Emergency Department Pathway and Stroke), ongoing and regular updates of these analyses across a wide range of clinical areas would help inform and demonstrate the effects of continuous quality improvements to the hospital system in SA.

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8. Appendices

Appendix A. Proportions of patients discharged after stroke readmitting with particular Major Diagnostic Categories (MDCs) for the six months between June – December 2016

MDC	Long Description	Proportion at 90 days	Proportion at 30 days	Inclusion
0	Unassignable to MDC	0	0	No
1	Diseases & Disorders of the Nervous System	0.54	0.49	Yes
2	Diseases & Disorders of the Eye	0.01	0.01	No
3	Diseases & Disorders of the Ear, Nose, Mouth & Throat	0.02	0.02	Yes
4	Diseases & Disorders of the Respiratory System	0.03	0.02	Yes
5	Diseases & Disorders of the Circulatory System	0.04	0.02	Yes
6	Diseases & Disorders of the Digestive System	0.02	0.01	No
7	Diseases & Disorders of the Hepatobiliary System & Pancreas	0.01	0.00	No
8	Diseases & Disorders of the Musculoskeletal System & Connective Tissue	0.01	0.01	Yes
9	Diseases & Disorders of the Skin, Subcutaneous Tissue & Breast	0.01	0.01	No
10	Endocrine, Nutritional & Metabolic Diseases & Disorders	0.02	0.01	No
11	Diseases & Disorders of the Kidney & Urinary Tract	0.05	0.02	No
12	Diseases & Disorders of the Male Reproductive System	0.00	0.00	No
13	Diseases & Disorders of the Female Reproductive System	0.01	0.00	No
14	Pregnancy, Childbirth & the Puerperium	0.00	0.00	No
15	Newborns & Other Neonates	0.00	0.00	No
16	Diseases & Disorders of Blood, Blood Forming Organs, Immunological Disorders	0.01	0.00	No
17	Neoplastic Disorders (Haematological & Solid Neoplasms)	0.01	0.01	No
18	Infectious & Parasitic Diseases, Systemic or Unspecified Sites	0.00	0.00	No
19	Mental Diseases & Disorders	0.00	0.00	No
20	Alcohol/Drug Use & Alcohol/Drug Induced Organic Mental Disorders	0.00	0.00	No
21	Injuries, Poisonings & Toxic Effects of Drugs	0.02	0.02	No
22	Burns	0.00	0.00	No
23	Factors Influencing Health Status & Other Contacts with Health Services	0.22	0.20	No
24	Unrelated or Error DRGs	0	0	No

Source: AR-DRG V9.0 Descriptions from The Australian Consortium for Classification Development (accessed 10 February 2018)

Appendix B.1a. Pre-adjusted baseline characteristics of Chest Pain Patients by Hospital in the January to March quarter of 2015

	Hospital				Standardised Mean Differences					
	1	2	3	4	1 - 2	1 - 3	1 - 4	2 - 3	2 - 4	3 -4
No. of patients	927	671	1,070	886						
Patient Characteristics:										
Mean Age (years)	57.86	58.23	56.60	54.71	0.02	0.07	**0.17**	0.09	**0.19**	0.10
Proportion Female	0.51	0.55	0.45	0.48	0.07	**0.12**	0.06	**0.19**	**0.12**	0.07
Mean SEIFA decile	6.14	4.00	5.89	2.67	**0.75**	0.09	**1.21**	**0.66**	**0.46**	**1.12**
Proportion with COPD	0.02	0.03	0.02	0.03	0.06	0.01	0.06	0.07	0.00	0.08
Proportion with cancer	0.02	0.01	0.02	0.02	0.06	0.04	0.01	0.01	0.06	0.05
Proportion with diabetes	0.12	0.12	0.12	0.14	0.00	0.02	0.04	0.02	0.05	0.07
Proportion of indigenous	0.01	0.03	0.04	0.03	0.10	**0.14**	**0.12**	0.04	0.02	0.03
Proportion with unstated ethnicity	0.04	0.08	0.10	0.01	**0.20**	**0.26**	**0.13**	0.07	**0.33**	**0.40**
Proportion after hours presentation	0.60	0.61	0.59	0.63	0.02	0.01	0.06	0.03	0.03	0.07
Proportion with existing circulatory disorder	0.26	0.28	0.28	0.35	0.05	0.05	**0.19**	0.00	**0.14**	**0.14**
Proportion with renal disease	0.08	0.05	0.07	0.06	**0.11**	0.04	0.06	0.08	0.06	0.02
Proportion with dementia or alzheimers	0.00	0.01	0.00	0.00	0.04	0.02	0.02	0.02	0.02	0.00
Proportion with previous ED Presentation for R070-R074	0.07	0.07	0.09	0.07	0.02	0.08	0.02	0.06	0.00	0.06
Proportion with previous ED presentation for I200-I219	0.02	0.04	0.01	0.03	**0.13**	0.07	0.07	**0.20**	0.06	**0.14**

Socio Economic Indicators For Areas (SEIFA) (1=lowest decile); chronic obstructive pulmonary disease (COPD); Standardised Mean Differences > .1 in bold font

Appendix B.1b. Post-CBPS baseline characteristics Chest Pain Patients by Hospital in the January to March quarter of 2015

	Hospital				Standardised Mean Differences					
	1	2	3	4	1 - 2	1 - 3	1 - 4	2 - 3	2 - 4	3 -4
Patient Characteristics:										
Mean Age (years)	57.60	56.72	57.09	56.72	0.05	0.03	0.05	0.02	0.00	0.02
Proportion Female	0.49	0.50	0.49	0.50	0.02	0.00	0.03	0.02	0.01	0.03
Mean SEIFA decile	5.21	4.44	4.98	4.60	**0.27**	0.08	**0.21**	**0.19**	0.06	**0.13**
Proportion with COPD	0.03	0.03	0.02	0.03	0.01	0.02	0.03	0.03	0.02	0.05
Proportion with cancer	0.01	0.03	0.03	0.03	0.08	0.10	**0.13**	0.02	0.05	0.03
Proportion with diabetes	0.14	0.13	0.11	0.12	0.00	0.08	0.05	0.08	0.04	0.04
Proportion of indigenous	0.03	0.03	0.04	0.04	0.03	0.03	0.06	0.06	0.09	0.03
Proportion with unstated ethnicity	0.06	0.06	0.06	0.04	0.03	0.02	0.08	0.02	0.05	0.07
Proportion after hours presentation	0.60	0.60	0.60	0.62	0.02	0.02	0.02	0.00	0.04	0.04
Proportion with existing circulatory disorder	0.32	0.31	0.28	0.34	0.01	0.08	0.04	0.07	0.05	**0.13**
Proportion with renal disease	0.07	0.07	0.07	0.08	0.03	0.03	0.06	0.00	0.03	0.03
Proportion with dementia or alzheimers	0.01	0.00	0.01	0.01	0.05	0.01	0.02	0.07	0.08	0.01
Proportion with previous ED Presentation for R070-R074	0.08	0.07	0.08	0.07	0.02	0.00	0.02	0.02	0.00	0.01
Proportion with previous ED presentation for I200-I219	0.03	0.03	0.02	0.03	0.02	0.06	0.01	0.05	0.01	0.05

Socio Economic Indicators For Areas (SEIFA) (1=lowest decile); chronic obstructive pulmonary disease (COPD); Standardised Mean Differences >

Appendix B.2a. Pre-adjusted baseline characteristics of Chest Pain Patients by Hospital in the January to March quarter of 2016

	Hospital				Standardised Mean Differences					
	1	2	3	4	1 - 2	1 - 3	1 - 4	2 - 3	2 - 4	3 -4
No. of patients	984	709	1,180	991						
Patient Characteristics:										
Mean Age (years)	58.02	57.06	56.14	53.82	0.05	0.10	**0.22**	0.05	**0.17**	**0.12**
Proportion Female	0.51	0.48	0.46	0.50	0.06	0.10	0.02	0.04	0.04	0.08
Mean SEIFA decile	5.92	3.98	5.96	2.81	**0.69**	0.01	**1.10**	**0.70**	**0.41**	**1.11**
Proportion with COPD	0.02	0.01	0.01	0.03	0.06	0.07	0.04	0.01	**0.11**	**0.11**
Proportion with cancer	0.02	0.03	0.02	0.02	0.02	0.01	0.05	0.01	0.07	0.06
Proportion with diabetes	0.11	0.11	0.10	0.14	0.01	0.03	0.08	0.02	0.09	0.11
Proportion of indigenous	0.01	0.03	0.03	0.04	0.10	**0.11**	**0.19**	0.00	0.09	0.08
Proportion with unstated ethnicity	0.04	0.07	0.12	0.00	**0.12**	**0.33**	**0.17**	**0.20**	**0.29**	**0.49**
Proportion after hours presentation	0.60	0.63	0.61	0.58	0.05	0.01	0.05	0.05	0.10	0.06
Proportion with existing circulatory disorder	0.23	0.25	0.27	0.26	0.04	0.07	0.05	0.03	0.01	0.02
Proportion with renal disease	0.07	0.05	0.06	0.05	0.06	0.01	0.05	0.05	0.02	0.04
Proportion with dementia or alzheimers	0.01	0.00	0.01	0.00	0.07	0.01	0.03	0.08	0.04	0.04
Proportion with previous ED Presentation for R070-R074	0.10	0.13	0.11	0.12	**0.11**	0.03	0.09	0.07	0.02	0.05
Proportion with previous ED presentation for I200-I219	0.03	0.07	0.03	0.05	**0.22**	0.02	**0.12**	**0.24**	0.10	**0.14**

Socio Economic Indicators For Areas (SEIFA) (1=lowest decile); chronic obstructive pulmonary disease (COPD); Standardised Mean Differences >

Appendix B.2b. Post-CBPS baseline characteristics Chest Pain Patients by Hospital in the January to March quarter of 2016

	Hospital				Standardised Mean Differences					
	1	2	3	4	1 - 2	1 - 3	1 - 4	2 - 3	2 - 4	3 -4
Patient Characteristics:										
Mean Age (years)	57.27	55.99	56.16	56.05	0.07	0.06	0.06	0.01	0.00	0.01
Proportion Female	0.49	0.47	0.48	0.51	0.05	0.02	0.04	0.03	0.09	0.06
Mean SEIFA decile	5.20	4.38	5.04	4.80	**0.29**	0.06	**0.14**	**0.23**	**0.15**	0.08
Proportion with COPD	0.02	0.01	0.02	0.02	0.03	0.05	0.01	0.09	0.04	0.04
Proportion with cancer	0.02	0.02	0.03	0.02	0.02	0.06	0.02	0.08	0.04	0.04
Proportion with diabetes	0.12	0.13	0.10	0.11	0.02	0.06	0.03	0.08	0.05	0.03
Proportion of indigenous	0.02	0.03	0.03	0.03	0.08	0.03	0.05	0.05	0.02	0.02
Proportion with unstated ethnicity	0.06	0.07	0.07	0.09	0.03	0.03	0.10	0.00	0.08	0.08
Proportion after hours presentation	0.59	0.61	0.60	0.59	0.04	0.02	0.01	0.02	0.05	0.03
Proportion with existing circulatory disorder	0.28	0.26	0.25	0.28	0.04	0.07	0.01	0.03	0.04	0.07
Proportion with renal disease	0.06	0.06	0.07	0.06	0.03	0.03	0.00	0.01	0.02	0.03
Proportion with dementia or alzheimers	0.01	0.00	0.00	0.01	0.04	0.03	0.02	0.01	0.06	0.05
Proportion with previous ED Presentation for R070-R074	0.11	0.12	0.11	0.11	0.03	0.02	0.00	0.01	0.03	0.02
Proportion with previous ED presentation for I200-I219	0.04	0.05	0.03	0.04	0.04	0.07	0.01	**0.11**	0.05	0.06

Socio Economic Indicators For Areas (SEIFA) (1=lowest decile); chronic obstructive pulmonary disease (COPD); Standardised Mean Differences > .1 in bold font

Appendix B.3a. Pre-adjusted baseline characteristics of Chest Pain Patients by Hospital in the January to March quarter of 2017

	Hospital				Standardised Mean Differences					
	1	2	3	4	1 - 2	1 - 3	1 - 4	2 - 3	2 - 4	3 -4
No. of patients	1,041	700	1,154	1,002						
Patient Characteristics:										
Mean Age (years)	58.84	58.46	56.08	54.29	0.02	**0.15**	**0.24**	**0.13**	**0.22**	0.10
Proportion Female	0.50	0.49	0.44	0.48	0.02	**0.13**	0.04	0.10	0.02	0.09
Mean SEIFA decile	5.99	4.06	5.99	2.75	**0.68**	0.00	**1.13**	**0.68**	**0.46**	**1.13**
Proportion with COPD	0.02	0.03	0.02	0.04	0.06	0.01	0.09	0.07	0.03	0.10
Proportion with cancer	0.02	0.01	0.02	0.02	0.04	0.01	0.00	0.05	0.03	0.01
Proportion with diabetes	0.11	0.09	0.13	0.14	0.07	0.07	0.09	**0.14**	**0.16**	0.02
Proportion of indigenous	0.01	0.02	0.04	0.04	0.03	**0.16**	**0.17**	**0.13**	**0.14**	0.01
Proportion with unstated ethnicity	0.03	0.08	0.10	0.01	**0.22**	**0.31**	0.07	0.09	**0.29**	**0.38**
Proportion after hours presentation	0.62	0.61	0.60	0.58	0.02	0.06	0.09	0.04	0.07	0.03
Proportion with existing circulatory disorder	0.28	0.21	0.27	0.25	**0.15**	0.02	0.06	**0.13**	0.10	0.04
Proportion with renal disease	0.07	0.05	0.07	0.06	0.08	0.03	0.06	0.05	0.02	0.02
Proportion with dementia or alzheimers	0.01	0.01	0.01	0.00	0.06	0.04	0.07	0.01	0.01	0.02
Proportion with previous ED Presentation for R070-R074	0.11	0.12	0.11	0.14	0.02	0.01	0.09	0.03	0.07	0.10
Proportion with previous ED presentation for I200-I219	0.04	0.07	0.03	0.05	**0.14**	0.06	0.04	**0.19**	0.09	0.10

Socio Economic Indicators For Areas (SEIFA) (1=lowest decile); chronic obstructive pulmonary disease (COPD); Standardised Mean Differences > .1 in bold font

Appendix B.3b. Post-CBPS baseline characteristics Chest Pain Patients by Hospital in the January to March quarter of 2017

	Hospital				Standardised Mean Differences					
	1	2	3	4	1 - 2	1 - 3	1 - 4	2 - 3	2 - 4	3 -4
Patient Characteristics:										
Mean Age (years)	57.54	57.19	57.28	56.89	0.02	0.01	0.03	0.00	0.02	0.02
Proportion Female	0.47	0.48	0.48	0.45	0.01	0.01	0.03	0.00	0.05	0.05
Mean SEIFA decile	5.16	4.53	4.96	4.84	0.22	0.07	0.11	0.15	0.11	0.04
Proportion with COPD	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.04	0.04	0.00
Proportion with cancer	0.02	0.02	0.02	0.01	0.01	0.00	0.02	0.02	0.01	0.02
Proportion with diabetes	0.13	0.13	0.12	0.12	0.02	0.03	0.02	0.01	0.00	0.01
Proportion of indigenous	0.02	0.03	0.03	0.03	0.03	0.05	0.04	0.02	0.01	0.01
Proportion with unstated ethnicity	0.06	0.05	0.06	0.06	0.03	0.01	0.00	0.04	0.03	0.01
Proportion after hours presentation	0.62	0.59	0.57	0.59	0.06	0.11	0.06	0.04	0.00	0.05
Proportion with existing circulatory disorder	0.28	0.27	0.28	0.29	0.02	0.01	0.03	0.02	0.05	0.02
Proportion with renal disease	0.07	0.07	0.06	0.07	0.02	0.01	0.00	0.04	0.02	0.02
Proportion with dementia or alzheimers	0.01	0.01	0.01	0.01	0.01	0.09	0.02	0.07	0.00	0.07
Proportion with previous ED Presentation for R070-R074	0.13	0.12	0.11	0.13	0.03	0.06	0.01	0.03	0.02	0.05
Proportion with previous ED presentation for I200-I219	0.05	0.05	0.03	0.05	0.01	0.09	0.01	0.09	0.00	0.09

Socio Economic Indicators For Areas (SEIFA) (1=lowest decile); chronic obstructive pulmonary disease (COPD); Standardised Mean Differences > .1 in bold font

Appendix B.4a. Pre-adjusted baseline characteristics of Chest Pain Patients in the first quarters of 2015, 2016 and 2017

	Jan-Mar 2015	Jan-Mar 2016	Jan-Mar 2017	Standardised Mean Differences		
	1	2	3	1 - 2	1 - 3	2 - 3
No. of patients	4,459	4,791	4,736			
Patient Characteristics:						
Mean Age (years)	55.99	55.64	56.17	0.02	0.01	0.03
Proportion Female	0.49	0.50	0.49	0.01	0.01	0.02
Mean SEIFA decile	4.81	4.78	4.83	0.01	0.00	0.02
Proportion with COPD	0.02	0.02	0.03	0.04	0.03	0.06
Proportion with cancer	0.02	0.02	0.02	0.01	0.01	0.03
Proportion with diabetes	0.11	0.10	0.10	0.03	0.02	0.01
Proportion of indigenous	0.03	0.02	0.03	0.02	0.00	0.02
Proportion with unstated ethnicity	0.05	0.06	0.06	0.02	0.01	0.00
Proportion after hours presentation	0.60	0.61	0.60	0.01	0.00	0.02
Proportion with existing circulatory disorder	0.26	0.23	0.23	0.07	0.08	0.00
Proportion with renal disease	0.06	0.06	0.06	0.03	0.02	0.01
Proportion with dementia or alzheimers	0.00	0.01	0.01	0.01	0.03	0.02
Proportion with previous ED Presentation for R070-R074	0.07	0.11	**0.11**	**0.13**	**0.14**	0.01
Proportion with previous ED presentation for I200-I219	0.02	0.04	0.04	0.09	0.09	0.00

Socio Economic Indicators For Areas (SEIFA) (1=lowest decile); chronic obstructive pulmonary disease (COPD); Standardised Mean Differences > .1 in bold font

Appendix B.4b. Post-CBPS baseline characteristics of Chest Pain Patients in the first quarters of 2015, 2016 and 2017

	Jan-Mar 2015	Jan-Mar 2016	Jan-Mar 2017	Standardised Mean Differences		
	1	2	3	1 - 2	1 - 3	2 - 3
Patient Characteristics:						
Mean Age (years)	55.97	55.89	55.96	0.00	0.00	0.00
Proportion Female	0.49	0.49	0.49	0.00	0.01	0.01
Mean SEIFA decile	4.81	4.79	4.83	0.01	0.01	0.01
Proportion with COPD	0.02	0.02	0.02	0.01	0.01	0.02
Proportion with cancer	0.02	0.02	0.02	0.01	0.01	0.00
Proportion with diabetes	0.11	0.10	0.11	0.00	0.01	0.01
Proportion of indigenous	0.03	0.03	0.03	0.00	0.00	0.01
Proportion with unstated ethnicity	0.06	0.06	0.06	0.00	0.00	0.00
Proportion after hours presentation	0.61	0.60	0.61	0.01	0.00	0.01
Proportion with existing circulatory disorder	0.24	0.24	0.24	0.01	0.01	0.00
Proportion with renal disease	0.06	0.06	0.06	0.02	0.00	0.02
Proportion with dementia or alzheimers	0.00	0.01	0.01	0.02	0.02	0.00
Proportion with previous ED Presentation for R070-R074	0.09	0.10	0.10	0.02	0.02	0.00
Proportion with previous ED presentation for I200-I219	0.03	0.03	0.04	0.00	0.00	0.00

Socio Economic Indicators For Areas (SEIFA) (1=lowest decile); chronic obstructive pulmonary disease (COPD); Standardised Mean Differences > .1 in bold font

Appendix C.1a. Pre-adjusted baseline characteristics of Stroke Patients by Hospital in the January to March quarter of 2015

	Hospital				Standardised Mean Differences					
	1	2	3	4	1 - 2	1 - 3	1 - 4	2 - 3	2 - 4	3 -4
No. of patients	119	64	139	60						
Patient Characteristics:										
Mean Age (years)	72.97	71.31	71.45	69.50	**0.11**	0.10	**0.22**	0.01	**0.12**	**0.13**
Proportion Female	0.55	0.52	0.40	0.48	0.06	**0.30**	**0.13**	**0.24**	0.06	**0.18**
Mean SEIFA decile	5.55	4.20	5.86	3.43	**0.49**	**0.11**	**0.78**	**0.61**	**0.28**	**0.89**
Proportion transferred	0.43	0.42	0.34	0.42	0.01	**0.18**	0.02	**0.17**	0.01	0.16
Proportion with COPD	0.05	0.00	0.02	0.03	**0.30**	**0.17**	0.10	**0.13**	0.20	0.07
Proportion with cancer	0.06	0.03	0.04	0.08	**0.13**	0.10	**0.11**	0.02	**0.24**	**0.22**
Proportion with diabetes	0.24	0.22	0.31	0.23	0.04	**0.17**	0.00	**0.21**	0.03	**0.17**
Proportion of indigenous	0.02	0.02	0.01	0.00	0.01	0.09	**0.16**	0.08	**0.15**	0.07
Proportion with unstated ethnicity	0.07	0.09	0.10	0.02	0.10	**0.13**	**0.19**	0.03	**0.29**	**0.32**
Proportion after hours presentation	0.66	0.55	0.73	0.57	**0.23**	**0.16**	**0.19**	**0.39**	0.04	**0.35**
Proportion with existing circulatory disorder	0.71	0.70	0.76	0.73	0.03	**0.11**	0.04	**0.13**	0.07	0.07
Proportion with renal disease	0.11	0.16	0.21	0.23	**0.12**	**0.26**	**0.33**	**0.14**	**0.20**	0.07
Proportion with dementia or alzheimers	0.04	0.02	0.01	0.07	**0.15**	**0.16**	**0.14**	0.01	**0.29**	**0.30**
Proportion with previous ED Presentation for Stroke B070	0.02	0.00	0.01	0.05	0.13	0.08	**0.27**	0.06	**0.40**	**0.34**

Socio Economic Indicators For Areas (SEIFA) (1=lowest decile); chronic obstructive pulmonary disease (COPD); Standardised Mean Differences > .1 in bold font

Appendix C.1b. Post-CBPS baseline characteristics Stroke Patients by Hospital in the January to March quarter of 2015

	Hospital				Standardised Mean Differences					
	1	2	3	4	1 - 2	1 - 3	1 - 4	2 - 3	2 - 4	3 -4
Patient Characteristics:										
Mean Age (years)	70.85	71.36	70.56	71.01	0.03	0.02	0.01	0.05	0.02	0.03
Proportion Female	0.45	0.47	0.46	0.48	0.04	0.02	0.05	0.03	0.01	0.04
Mean SEIFA decile	5.17	4.88	5.13	5.02	0.10	0.01	0.05	0.09	0.05	0.04
Proportion transferred	0.40	0.42	0.39	0.41	0.04	0.01	0.01	0.05	0.03	0.03
Proportion with COPD	0.02	0.00	0.02	0.01	**0.14**	0.00	0.08	**0.14**	0.06	0.08
Proportion with cancer	0.06	0.06	0.06	0.05	0.01	0.00	0.00	0.01	0.01	0.00
Proportion with diabetes	0.27	0.31	0.27	0.25	0.10	0.01	0.05	0.10	**0.14**	0.04
Proportion of indigenous	0.01	0.00	0.01	0.00	0.04	0.01	0.08	0.05	0.04	0.09
Proportion with unstated ethnicity	0.07	0.06	0.07	0.06	0.04	0.01	0.05	0.04	0.01	0.06
Proportion after hours presentation	0.67	0.66	0.66	0.63	0.02	0.02	0.09	0.00	0.07	0.07
Proportion with existing circulatory disorder	0.74	0.77	0.74	0.73	0.07	0.02	0.03	0.08	0.10	0.01
Proportion with renal disease	0.17	0.18	0.17	0.17	0.02	0.00	0.00	0.03	0.02	0.01
Proportion with dementia or alzheimers	0.03	0.02	0.03	0.03	0.05	0.01	0.03	0.04	0.07	0.03
Proportion with previous ED Presentation for Stroke B070	0.02	0.00	0.01	0.02	**0.13**	0.08	0.00	0.05	**0.13**	0.08

Socio Economic Indicators For Areas (SEIFA) (1=lowest decile); chronic obstructive pulmonary disease (COPD); Standardised Mean Differences > .1 in bold font.

Appendix C.2a. Pre-adjusted baseline characteristics of Stroke Patients by Hospital in the January to March quarter of 2016

	Hospital				Standardised Mean Differences					
	1	2	3	4	1 - 2	1 - 3	1 - 4	2 - 3	2 - 4	3 -4
No. of patients	137	22	175	52						
Patient Characteristics:										
Mean Age (years)	73.84	72.95	73.46	73.65	0.06	0.03	0.01	0.03	0.05	0.01
Proportion Female	0.42	0.36	0.49	0.44	**0.11**	**0.14**	0.05	**0.25**	**0.16**	0.09
Mean SEIFA decile	5.66	5.09	5.79	3.19	**0.21**	0.05	**0.93**	**0.26**	**0.71**	**0.98**
Proportion transferred	0.32	0.55	0.35	0.37	**0.47**	0.06	0.09	**0.41**	**0.38**	0.04
Proportion with COPD	0.01	0.05	0.02	0.00	**0.31**	**0.13**	0.06	**0.18**	**0.37**	**0.18**
Proportion with cancer	0.04	0.05	0.06	0.04	0.04	0.10	0.01	0.06	0.03	0.09
Proportion with diabetes	0.26	0.27	0.22	0.31	0.04	0.09	**0.12**	**0.13**	0.08	**0.21**
Proportion of indigenous	0.01	0.05	0.01	0.00	**0.43**	0.02	0.08	**0.45**	**0.52**	0.06
Proportion with unstated ethnicity	0.07	0.05	0.15	0.04	0.09	**0.25**	**0.11**	**0.34**	0.02	**0.36**
Proportion after hours presentation	0.61	0.68	0.67	0.48	**0.16**	**0.14**	**0.26**	0.02	**0.41**	**0.40**
Proportion with existing circulatory disorder	0.55	0.45	0.62	0.54	**0.19**	**0.15**	0.02	**0.34**	**0.17**	**0.17**
Proportion with renal disease	0.15	0.18	0.19	0.13	0.08	**0.11**	0.05	0.03	**0.13**	**0.16**
Proportion with dementia or alzheimers	0.04	0.00	0.03	0.04	**0.23**	0.05	0.03	**0.18**	**0.21**	0.02
Proportion with previous ED Presentation for Stroke B070	0.04	0.09	0.02	0.04	**0.31**	**0.11**	0.01	**0.42**	**0.30**	**0.12**

Socio Economic Indicators For Areas (SEIFA) (1=lowest decile); chronic obstructive pulmonary disease (COPD); Standardised Mean Differences > .1 in bold font

Appendix C.2b. Post-CBPS baseline characteristics Stroke Patients by Hospital in the January to March quarter of 2016

	Hospital				Standardised Mean Differences					
	1	2	3	4	1 - 2	1 - 3	1 - 4	2 - 3	2 - 4	3 -4
Patient Characteristics:										
Mean Age (years)	73.35	77.92	73.36	75.37	**0.30**	0.00	**0.13**	**0.30**	**0.17**	**0.13**
Proportion Female	0.45	0.43	0.44	0.58	0.03	0.00	**0.27**	0.03	**0.30**	**0.27**
Mean SEIFA decile	5.36	4.64	5.36	5.19	**0.27**	0.00	0.06	**0.27**	**0.21**	0.06
Proportion transferred	0.36	0.33	0.36	0.36	0.07	0.00	0.02	0.07	0.06	0.02
Proportion with COPD	0.01	0.01	0.01	0.00	0.00	0.00	**0.11**	0.00	**0.12**	**0.11**
Proportion with cancer	0.05	0.05	0.05	0.06	0.01	0.00	0.08	0.01	0.07	0.07
Proportion with diabetes	0.25	0.29	0.25	0.23	0.07	0.00	0.06	0.07	**0.13**	0.06
Proportion of indigenous	0.01	0.01	0.01	0.00	0.00	0.00	0.08	0.00	0.08	0.08
Proportion with unstated ethnicity	0.09	0.10	0.09	0.09	0.01	0.00	0.01	0.01	0.01	0.00
Proportion after hours presentation	0.62	0.54	0.62	0.58	**0.16**	0.00	0.09	**0.17**	0.08	0.09
Proportion with existing circulatory disorder	0.57	0.53	0.57	0.59	0.07	0.00	0.05	0.07	**0.12**	0.05
Proportion with renal disease	0.16	0.20	0.16	0.19	0.10	0.00	0.07	0.10	0.03	0.07
Proportion with dementia or alzheimers	0.03	0.00	0.03	0.03	**0.17**	0.00	0.00	**0.17**	**0.18**	0.00
Proportion with previous ED Presentation for Stroke B070	0.03	0.03	0.03	0.03	0.01	0.00	0.00	0.01	0.00	0.00

Socio Economic Indicators For Areas (SEIFA) (1=lowest decile); chronic obstructive pulmonary disease (COPD); Standardised Mean Differences > .1 in bold font

Appendix C.3a. Pre-adjusted baseline characteristics of Stroke Patients by Hospital in the January to March quarter of 2017

	Hospital				Standardised Mean Differences					
	1	2	3	4	1 - 2	1 - 3	1 - 4	2 - 3	2 - 4	3 -4
No. of patients	131	13	187	61						
Patient Characteristics:										
Mean Age (years)	72.92	73.54	75.89	73.05	0.04	**0.21**	0.01	**0.16**	0.03	**0.20**
Proportion Female	0.54	0.46	0.55	0.49	**0.16**	0.01	0.10	**0.17**	0.06	**0.11**
Mean SEIFA decile	5.77	3.85	5.60	3.44	**0.67**	0.06	**0.81**	**0.61**	**0.14**	**0.75**
Proportion transferred	0.34	0.46	0.30	0.46	**0.25**	0.09	**0.24**	**0.34**	0.01	**0.34**
Proportion with COPD	0.04	0.00	0.01	0.02	**0.29**	**0.25**	**0.16**	0.04	**0.12**	0.08
Proportion with cancer	0.08	0.08	0.05	0.07	0.00	**0.12**	0.04	**0.12**	0.05	0.07
Proportion with diabetes	0.21	0.23	0.22	0.20	0.06	0.05	0.02	0.02	0.08	0.07
Proportion of indigenous	0.01	0.08	0.01	0.00	**0.69**	0.03	0.08	**0.66**	**0.76**	**0.11**
Proportion with unstated ethnicity	0.06	0.15	0.13	0.03	**0.32**	**0.23**	0.10	0.09	**0.42**	**0.33**
Proportion after hours presentation	0.49	0.62	0.63	0.51	**0.26**	**0.29**	0.04	0.03	**0.22**	**0.25**
Proportion with existing circulatory disorder	0.54	0.69	0.60	0.69	**0.31**	**0.13**	**0.30**	**0.18**	0.01	**0.17**
Proportion with renal disease	0.16	0.15	0.14	0.16	0.02	0.06	0.01	0.04	0.03	0.07
Proportion with dementia or Alzheimers	0.06	0.08	0.06	0.05	0.07	0.01	0.05	0.05	**0.12**	0.06
Proportion with previous ED Presentation for Stroke B070	0.04	0.08	0.05	0.07	**0.18**	0.05	**0.13**	**0.13**	0.05	0.08

Socio Economic Indicators For Areas (SEIFA) (1=lowest decile); chronic obstructive pulmonary disease (COPD); Standardised Mean Differences > .1 in bold font

Appendix C.3b. Post-CBPS baseline characteristics Stroke Patients by Hospital in the January to March quarter of 2017

	Hospital				Standardised Mean Differences					
	1	2	3	4	1 - 2	1 - 3	1 - 4	2 - 3	2 - 4	3 -4
Patient Characteristics:										
Mean Age (years)	74.40	73.17	74.39	74.13	0.09	0.00	0.02	0.09	0.07	0.02
Proportion Female	0.55	0.53	0.55	0.54	0.03	0.00	0.01	0.03	0.02	0.01
Mean SEIFA decile	5.10	4.53	5.09	5.03	**0.20**	0.00	0.03	**0.20**	**0.17**	0.02
Proportion transferred	0.38	0.52	0.38	0.36	**0.29**	0.00	0.05	**0.29**	**0.34**	0.05
Proportion with COPD	0.02	0.00	0.02	0.02	**0.13**	0.00	0.00	**0.13**	**0.13**	0.00
Proportion with cancer	0.06	0.06	0.06	0.06	0.01	0.00	0.00	0.01	0.01	0.01
Proportion with diabetes	0.21	0.26	0.21	0.18	**0.13**	0.00	0.06	**0.13**	**0.19**	0.06
Proportion of indigenous	0.02	0.02	0.02	0.00	0.01	0.00	**0.18**	0.01	**0.19**	**0.18**
Proportion with unstated ethnicity	0.09	0.09	0.09	0.10	0.01	0.00	0.01	0.01	0.02	0.01
Proportion after hours presentation	0.57	0.68	0.57	0.59	**0.23**	0.00	0.04	**0.23**	**0.19**	0.04
Proportion with existing circulatory disorder	0.60	0.82	0.60	0.62	**0.45**	0.00	0.04	**0.45**	**0.41**	0.04
Proportion with renal disease	0.15	0.13	0.15	0.16	0.05	0.00	0.04	0.04	0.09	0.04
Proportion with dementia or alzheimers	0.07	0.02	0.07	0.07	**0.19**	0.00	0.01	**0.19**	**0.20**	0.01
Proportion with previous ED Presentation for Stroke B070	0.04	0.03	0.04	0.04	0.05	0.00	0.00	0.05	0.06	0.00

Socio Economic Indicators For Areas (SEIFA) (1=lowest decile); chronic obstructive pulmonary disease (COPD); Standardised Mean Differences > .1 in bold font

Appendix C.4a. Pre-adjusted baseline characteristics of Stroke Patients in the first quarters of 2015, 2016 and 2017

	Jan-Mar 2015	Jan-Mar 2016	Jan-Mar 2017	Standardised Mean Differences		
	1	2	3	1 - 2	1 - 3	2 - 3
No. of patients	397	416	403			
Patient Characteristics:						
Mean Age (years)	71.78	73.36	74.25	0.10	**0.16**	0.06
Proportion Female	0.48	0.45	0.53	0.04	**0.11**	**0.16**
Mean SEIFA decile	5.15	5.33	5.24	0.07	0.03	0.03
Proportion transferred	0.40	0.37	0.35	0.06	0.09	0.03
Proportion with COPD	0.03	0.02	0.02	0.08	0.07	0.00
Proportion with cancer	0.05	0.05	0.06	0.00	0.05	0.05
Proportion with diabetes	0.26	0.25	0.22	0.03	0.10	0.07
Proportion of indigenous	0.01	0.01	0.01	0.03	0.00	0.03
Proportion with unstated ethnicity	0.07	0.10	0.09	0.08	0.07	0.02
Proportion after hours presentation	0.65	0.61	0.57	0.08	**0.18**	0.10
Proportion with existing circulatory disorder	0.73	0.56	0.59	**0.37**	**0.29**	0.07
Proportion with renal disease	0.18	0.17	0.15	0.02	0.06	0.05
Proportion with dementia or alzheimers	0.04	0.05	0.06	0.05	**0.11**	0.07
Proportion with previous ED Presentation for Stroke B070	0.02	0.03	0.05	0.06	**0.18**	**0.12**

Socio Economic Indicators For Areas (SEIFA) (1=lowest decile); chronic obstructive pulmonary disease (COPD); Standardised Mean Differences > .1 in bold font

Appendix C.4b. Post-CBPS baseline characteristics of Stroke Patients in the first quarters of 2015, 2016 and 2017

	Jan-Mar 2015	Jan-Mar 2016	Jan-Mar 2017	Standardised Mean Differences		
	1	2	3	1 - 2	1 - 3	2 - 3
Patient Characteristics:						
Mean Age (years)	72.66	72.51	73.66	0.01	0.07	0.08
Proportion Female	0.49	0.49	0.50	0.00	0.02	0.02
Mean SEIFA decile	5.18	5.31	5.25	0.05	0.03	0.02
Proportion transferred	0.38	0.38	0.36	0.00	0.03	0.03
Proportion with COPD	0.02	0.02	0.02	0.04	0.01	0.03
Proportion with cancer	0.05	0.05	0.06	0.02	0.03	0.05
Proportion with diabetes	0.25	0.24	0.23	0.01	0.04	0.03
Proportion of indigenous	0.01	0.01	0.01	0.02	0.02	0.00
Proportion with unstated ethnicity	0.08	0.08	0.10	0.00	0.07	0.07
Proportion after hours presentation	0.62	0.61	0.60	0.01	0.03	0.02
Proportion with existing circulatory disorder	0.66	0.60	0.63	**0.12**	0.06	0.06
Proportion with renal disease	0.16	0.16	0.16	0.01	0.01	0.01
Proportion with dementia or alzheimers	0.05	0.04	0.06	0.02	0.05	0.07
Proportion with previous ED Presentation for Stroke B070	0.03	0.03	0.03	0.02	0.02	0.01

Socio Economic Indicators For Areas (SEIFA) (1=lowest decile); chronic obstructive pulmonary disease (COPD); Standardised Mean Differences > .1 in bold font

10.3.5 System Outcomes

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1. Executive Summary

The key questions for the System Outcomes Theme were:

1. How has Transforming Health improved the flow of patients through the system?
2. How has Transforming Health improved the flexibility of delivery of services in the system to manage variation that occurs in the system?
3. In what ways has Transforming Health promoted innovation to improve system performance?
4. In what ways has Transforming Health enabled the system to use different types of evidence to deliver high quality patient care?

Mixed methods were used to answer these questions. Questions 1 & 2 were explored using quantitative methods while questions 3 & 4 were answered using qualitative methods, specifically interviews with clinical leads.

Patient flow and Variation

Understanding the impact of variability on health services has been previously identified as an area where improvements can be made in order to better use resources and achieve patient satisfaction (Noon, Hankins, Cote, and Lieb, 2003).

Shewart's control chart (Shewart, 1931) enables the variation of the process to be monitored and assessed over time, with performance that is considered unusual to be separated from performance that is considered within the normal bounds of operation. Consequently, control charts represent a useful tool for the examination of the variation of flow of patients through the system in relation to Transforming Health.

In order to control for some expected variation, the cohort of patients included in the analysis was limited to those patients:

- Who were discharged home
- Experienced a cerebral infarction (ICD-10 code I-63), and
- Were classified to DRG B70B (stroke and other cerebral disease + severe complications).

The method of process control charts provided a method that enables visualisation of variation and also the identification of periods when the process could be considered to be outside normal bounds of operational expectations. As Neuhauser, Provost, and Bergman (2011) have identified, variation in observations is to be expected. Indeed, unlike a production process environment where only uniform products are being made, health is dealing with patients and patients vary – and therefore the care they receive will also vary. Thus, we should expect to see variation.

It was evident from the Control Charts and the descriptive profile of ward use, that:

- Variation in process – based on patient stay – existed
- Changes in the "system" occurred
- Changes at individual sites occurred
- The processes at individual sites are different – based on the length of stay (see **Figure 4**) and further evidenced by the use of different wards (see **Table 4** e.g., rehabilitation at Hospital C)
- Almost all variation was within normal expectations
- Only two events that fell outside the normal expectation were observed, and
- The bounds of variation for the processes (as a system and at individual sites) improved (i.e., there is evidence that patient flow improved).

The differences in the way in which care is provided at different sites reflects decision-making that has not been considered as part of the evaluation. The provision of rehabilitation for patients at Hospitals A and B will be provided differently to those patients admitted to Hospital C, and that is all that can be derived from the findings.
No attempt at considering the impact of different service processes was made.

While changes in the process of care can be observed and the approximate timing of the change of process identified, it is not possible on the basis of the analysis of the data alone to attribute the cause for the change to activities relating to Transforming Health. To do this would require significant additional investigation that is beyond the scope of this exercise.

While it would have been useful and interesting to consider the ability of services to deal with variation in service beyond what can be garnered from the Control Charts Method, it is not possible on the basis of the analysis of the data to form an opinion on this issue. To do this would require significant additional investigation which was beyond the time constraints of this exercise.

Planning for Change – The Use of Simulation

Noon et al. (2003) recognised that in order to pursue the delivery of better health services it is important for health care providers to understand the role of variability and that is possible to model such variability.

In pursuing the implementation of significant change, it is important to recognise that variability can and should be modelled. Indeed, simulation tools now exist that enable the detailed modelling of health services. Simulation enables the creation of a model that reasonably resembles the system of interest to be tested on a computer prior to its actually implementation. This significantly reduces the risk associated with such change and enables the testing of a greater range of solutions. To embark on any significant change without such modelling means that variation cannot have been reasonably accounted for and nor can a range of possibilities.

Given the insights from the qualitative evaluation, where only one clinical lead reported relying on the modelling undertaken centrally and no clinical leads used modelling or simulation to improve patient outcomes as part of Transforming Health, in combination with the evidence-base supporting the added value of simulation and modelling, it would seem to be a missed opportunity that Transforming Health was not predicated upon sophisticated simulation. Such modelling would have enabled the evaluation of predicted changes in service delivery to have been evaluated against scenarios that would have been tested with rigour prior to implementation.

In future, it is hoped that SA Health employs simulation or other appropriate modelling tools prior to any such significant reform.

Innovation and Evidence-base

Six of 20 clinical leads were interviewed for the qualitative component of the systems evaluation. All models of care were approached and all were represented through the interviews. Similarly, representatives from all LHNs were approached and three LHNs were represented in the sample. Innovation as part of Transforming Health was seen to be new, more efficient, consistent clinical pathways across the system. The implementation of several clinical innovations was reported by clinical leads as part of Transforming Health. One clinical lead mentioned that their clinical innovations occurred prior to Transforming Health. Another clinical lead reported that the process of the development of models of care should not be considered innovative but good evidence-based practice. Another clinical lead reported that they thought Transforming Health was not successful as a consistent model of care was not rolled out across metropolitan Adelaide.

Data, health information and evidence-based practice were inter-related. All clinical leads were concerned about data access and the use of data and health information to either improve health practice and outcomes or monitor their outcomes. One model of care reported having good data and health information for monitoring their practice as a result of Transforming Health. Other areas hope that continued progress toward data access and health information improvements will come post Transforming Health.

Rivalry between sites was evident and all sites interviewed mentioned the value of patient care (clinical), research and teaching triad, including professorial positions and partnerships between the hospital, and South Australian Universities. This it was argued, supported better access to and use of the best available evidence. In addition, some sites with professorial positions (such as professors of medicine) were responsible for conducting research that contributes to the clinical evidence-base.

Limitations

There were several limitations to the System Outcomes evaluation including the short timelines, delays with ethics approvals, focus on only one model of care in the quantitative component and small sample size in the qualitative component (n=6). The findings from this study are in no way representative, should not be generalised and should be treated with caution.

2. Background

The 'Transforming Health' agenda conducted by SA Health across its metropolitan hospitals is an example of 'large-system transformation in health care'. Large-system transformation in health care is defined as 'interventions aimed at coordinated, system-wide change affecting multiple organisations and care providers, with the goal of significant improvements in the efficiency of health care delivery, the quality of patient care and population level outcomes' (Best et al 2012). In the case of Transforming Health, in addition to these goals are changes in system performance.

Three attributes critical for a successful health system are healthy people, superior care and fairness; while three attributes of a sustainable health system are affordability, acceptability and adaptability (Fineberg 2012). Delays, cancellations and bottlenecks within the system have resulted in the addition of more resources (beds, buildings and staff) to fix the problems (Haraden & Resar 2004). Inefficiency in health systems, marked by high costs and low performance, has resulted in the need for change, reform or transformation agendas. Reform or change efforts that focus on integrative strategies, attempting to change multiple things across the health system, can achieve successful and sustainable health systems (Fineberg 2012). SA Health has attempted such a reform agenda through the implementation of Transforming Health. The improvement initiatives in Transforming Health have involved infrastructure, realignment of services (service moves) and the introduction of models of care for Acute Coronary Syndrome, Ortho-Geriatric Acute Hip Fracture Management, Rehabilitation Services and Stroke.

To support successful and sustainable health care systems health professionals and administrators are encouraged to: enhance quality and safety of medical care; deliver patient-centred care; use systems research to improve flow and manage variation, learn from peers and the evidence, use innovation and develop an ethos of medical professionalism that values accountability above autonomy (Fineberg 2012).

This part of the evaluation of SA Health's transformation agenda picks up on four of these: flow, variation, innovation and evidence-base. This evaluation will use systems science to analyse patient flow and variation before and after Transforming Health. It also draws on the experience of clinical leads directly involved in the development and implementation of models of care, to examine their use of innovation and problem-solving through modelling.

2.1. Statistical Control Process in Health

Organisations are established to carry out particular actions, be it the manufacture of goods or the service of customers. In order to achieve the desired goals of the organisation processes are established with the intent of achieving the specified outputs and outcomes.

Understanding the impact of variability on health services has been previously identified as an area where improvements can be made in order to better use resources and achieve patient satisfaction (Noon, Hankins, Cote, and Lieb, 2003).

In order to monitor the performance of the organisation in achieving its goals, various approaches to monitoring process performance have been established, including Shewart's control chart which was developed in response to variation in the quality of manufactured products (1931). Shewart's control chart, or process behaviour chart as Wheeler (2003) prefers to describe Shewart's control charts, enable the variation of the process to be monitored and assessed over time with performance that is considered unusual to be separated from performance that is considered within the normal bounds of operation.

While the origin of Shewart's control chart lies within the manufacturing sector, the method has been used to examine health care performance with the aim of improving the understanding of performance, assisting the development of process stability and the identification of improvement or deterioration in performance (Schwab, Sorbo, Cunningham, Craven, and Watson,1999; Benneyan, Lloyd, and Plsek, 2003; O'Brien, Williams, Blondell, and Jelinek, 2006; Thor, Lundberg, Ask, Olsson, Carli, Härenstam, and Brommels, 2007; Neuhauser, Provost, and Bergman, 2011; Koetsier, van der Veer, Jager, Peek, and de Keizer, 2012; Woodall, Adams, and Benneyan, 2012).

Consequently, control charts represent a useful tool for the examination of the variation of flow of patients through the system in relation to Transforming Health.

3. Evaluation questions

The key questions for the System Outcomes Theme were:

1. How has Transforming Health improved the flow of patients through the system?
2. How has Transforming Health improved the flexibility of delivery of services in the system to manage variation that occurs in the system?
3. In what ways has Transforming Health promoted innovation to improve system performance?
4. In what ways has Transforming Health enabled the system to use different types of evidence to deliver high quality patient care?

These questions were explored using both quantitative and qualitative methods.

4. Methods

4.1. Quantitative – Control Charts

Data relating to the treatment of stroke and acute coronary care syndrome patients were obtained from SA Health.

Preliminary analysis of the data was undertaken to ensure that the data was consistent and did not include unwanted observations.

Descriptive analysis of the data was undertaken and control charts were constructed for stroke patients based on the method described by Wheeler (2003).

In order to ensure that only similar patient observations were being included in the control charts, analysis was limited to patients discharged home and who suffered a stroke as coded by Diagnostic Related Group B70B (stroke and other cerebral disease + severe complications) and ICD-10 classification of cerebral infarction (I63).

4.2. Qualitative – Interviews

For Questions 3 & 4, the benefit of improved system performance across the health sector in South Australia was realised though interviewing the Clinical Leads associated with four selected models of care (Acute Coronary Syndrome, Rehabilitation Services, Orthogeriatric Acute Hip Fracture and Stroke). Thus purposeful sampling was undertaken, as the clinical leads are 'information rich' (Patton, 2002: 230), that is with the knowledge and experience that enables them to best answer the evaluation questions. The available sample size is small (n=20) and constrained by both the number of clinical leads available (i.e. number of available clinical leads that meet the selection criteria) and the project funding. Recruitment was via direct email to the clinical leads, inviting them to participate voluntarily. A semi-structured interview guide was used in all the interviews (Appendix 1). The interviews were voice-recorded and transcribed, and 10% of the transcripts were checked for accuracy. Minor corrections were made to acronyms used and names. A copy of the transcript was supplied back to all clinical leads who were offered a week within which to make changes to their transcript. One clinical lead made minor changes to their transcript to improve comprehension. The transcripts were entered into QSR Nvivo11 qualitative data analysis software. Given the small number of interviews, analysis was undertaken based on the manifest content; the visible and obvious components of the qualitative interview (Graneheim and Lundman, 2004). An interpretive paradigm was used to understand the qualitative interviews, meaning that analysis focused on learning about what was meaningful and relevant to the clinical leads (Neuman, 1997). Content analysis of the interviews was undertaken based on the research questions, where manifest themes were coded.

5. Results

5.1. Stroke

As shown in **Table 1** the majority of stroke patients, but not all patient observations included in the data were categorised as having a cerebral infarction (I63).

Table 1: Frequency of patients with stroke related ICD-10 codes.

ICD Code	Description	Frequency	% of Sample
I60	Nontraumatic subarachnoid hemorrhage	354	4%
I61	Nontraumatic intracerebral hemorrhage	1,209	14%
I62	Other and unspecified nontraumatic intracranial hemorrhage	305	3%
I63	Cerebral infarction	5,744	65%
I65	Occlusion and stenosis of precerebral arteries, not resulting in cerebral infarction	0	0%
I66	Occlusion and stenosis of cerebral arteries, not resulting in cerebral infarction	196	2%
I67	Other cerebrovascular diseases	0	0%
I68	Cerebrovascular disorders in diseases classified elsewhere	0	0%
I69	Sequelae of cerebrovascular disease	0	0%
Others		1,064	12%
Total		8,872	100%

Note: ICD code and description source was http://www..icd10data.com/ICD10CM/Codes/I00-I99/I60-I69

To ensure that analysis was conducted on patients with similar conditions (and therefore likely to stay in the system for similar times), all subsequent analysis focused on patients with ICD code I63.

The data provided by SA Health included admissions during the years 2014 and 2017, as shown in **Table 2**. **Table 2** also details the number of patients admitted each year within the ICD-10 categories.

Table 2: DRG categories and patient numbers across the years.

Exclusion Category and DRG	Admission Year				Total Records	% of DRGs within each exlusion category
	2014	2015	2016	2017		
cerebral infraction (I63)						
STROKE&OTH CEREB DIS DIE/TRN<5D	36	153	212	173	574	10%
STROKE & OTH CEREB DIS -CSCC	151	462	735	565	1913	33%
STROKE & OTH CEREB DIS +CCC	142	321	368	239	1070	19%
STROKE & OTH CEREB DIS +SCC	292	656	723	516	2187	38%
Total	621	1592	2038	1493	5744	100%
non-traumatic cerebral haemorrhage (I60-I62)						
STROKE&OTH CEREB DIS DIE/TRN<5D	20	63	47	41	171	9%
STROKE & OTH CEREB DIS -CSCC	89	197	257	180	723	39%
STROKE & OTH CEREB DIS +CCC	29	106	95	96	326	17%
STROKE & OTH CEREB DIS +SCC	88	216	194	150	648	35%
Total	226	582	593	467	1868	100%
exclude (other ICD codes)						
STROKE&OTH CEREB DIS DIE/TRN<5D	13	44	45	25	127	10%
STROKE & OTH CEREB DIS -CSCC	95	259	278	174	806	64%
STROKE & OTH CEREB DIS +CCC	11	21	38	20	90	7%
STROKE & OTH CEREB DIS +SCC	37	72	83	45	237	19%
Total	156	396	444	264	1260	100%
Overall Total	1003	2570	3075	2224	8872	

Thirty eight percent of patients with a cerebral haemorrhage were classified as DRG B70B (stroke and other cerebral disease + severe complications). It can be seen that DRG B70B also included patients who had principle diagnoses other than I63. These other patients (shown in the groupings non-traumatic cerebral haemorrhage (I60-I62), and exclude (other ICD codes)) are reported here to show that each DRG is actually compromised of patients with a variety of principle diagnoses.

The average length of stay for patients who were discharged to different destinations was found to vary as shown in **Table 3**.

Table 3: Average length of stay by discharge destination and DRG. (Note: This data includes all diagnoses and is not limited to ICD-10, I63)

Nature of patient separation	DRG				Overall Average length of stay
	STROKE & OTH CEREBDIS DIE/TRN<5D	STROKE & OTH CEREB DIS -CSCC	STROKE & OTH CEREB DIS +CCC	STROKE & OTH CEREB DIS +SCC	
Administrative discharge		10.8	26.4	18.1	19.7
Died		2.7	12.6	5.7	5.5
Home		6.8	28.9	11.1	10.0
Hospital Transfer – down	3.0	7.9	17.9	10.0	9.6
Hospital Transfer up	1.4	11.6	22.7	12.8	9.5
Leave		9.7	64.2	31.2	29.5
Nursing home		9.9	31.0	16.1	21.7
Other HC accom		7.3	30.9	9.5	17.4
Retrieval	1.7				1.7
Self discharge		3.4	23.0	5.3	5.2
Unknown		0.3	8.9	2.2	2.4
Overall average length of stay	**2.3**	**6.9**	**23.8**	**11.3**	**10.8**

Note: The overall average length of stay are determined by the number of patients (ie. the overall averages are weighted) and cannot simply be determined by averaging the numbers shown in the table.

To control for some expected variation (e.g., based on patient discharge destination) the focus of the remaining results relates to patients with a cerebral infarction (ICD-10 classification ICD63) who were discharged home and were allocated to DRG B70B (stroke and other cerebral disease + severe complications).

The length of stay of patients admitted on different days of the week was considered as shown in **Figure 1**.

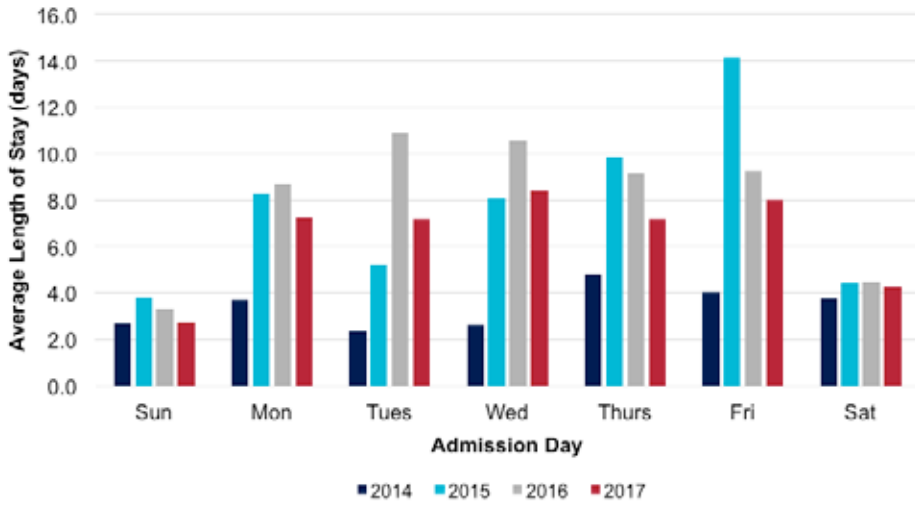


Figure 1: Average length of patient stay for stroke patients going home (n=1349) (as described) by day of admission and year of admissions.

Variation in the average length of stay was found to exist by day of week and year of admission. The average length of stay was found to have reduced for all days of admission during 2017.

The process control chart was developed for the subset of patients used in the remainder of the study as shown in **Figure 2**. As per Figure 1, the results shown in **Figure 2** relate to all patients with a cerebral infarction (ICD-10 classification I63) who were discharged home and allocated to DRG B70B.

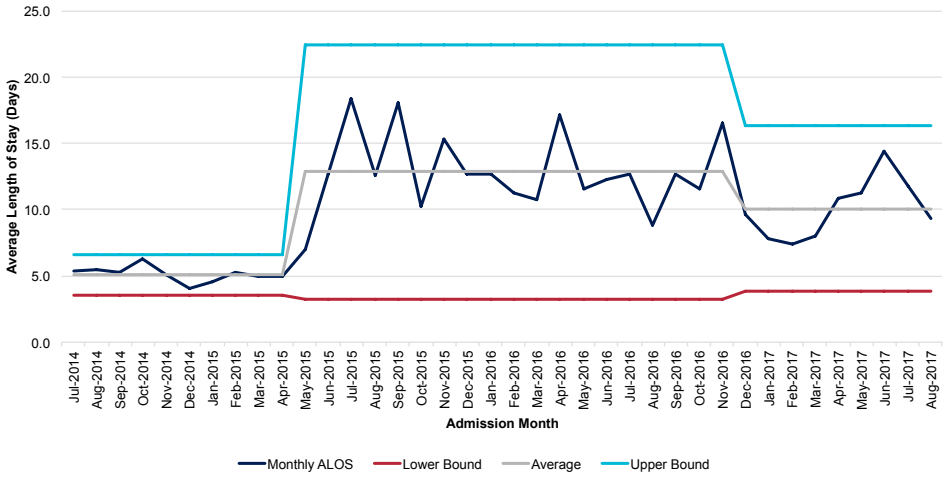
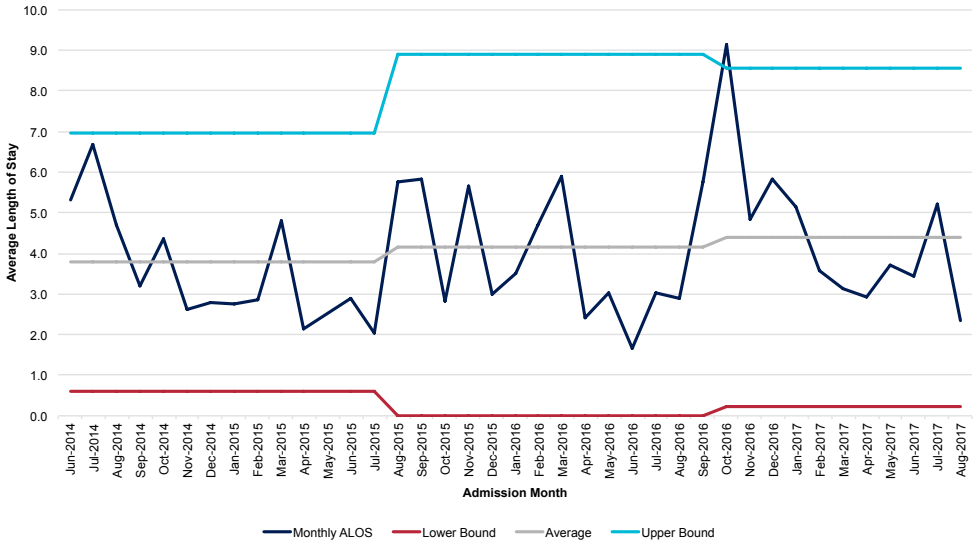


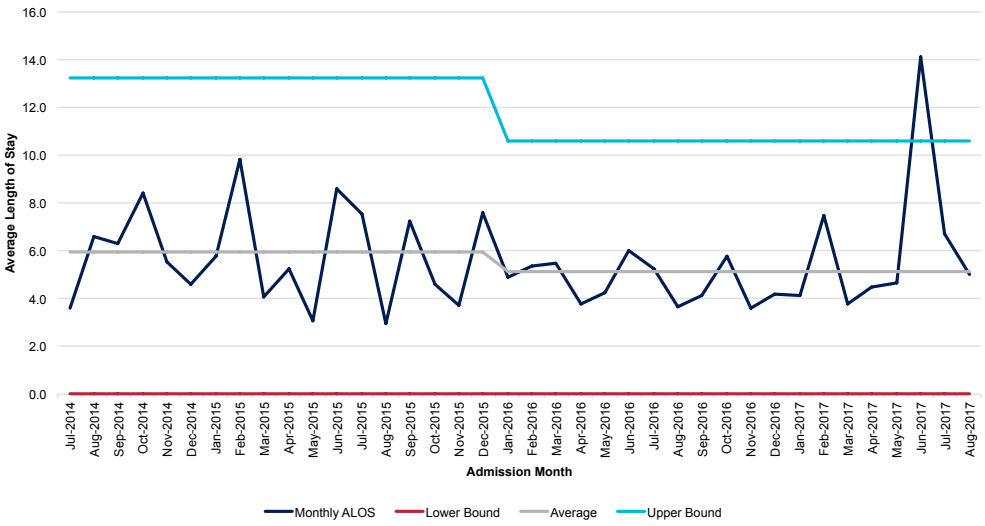
Figure 2: Process control chart for length of stay for stroke patients discharged home (n=1349).

Variation is evident and the process has changed over the period. There is little evidence of variation beyond what might be expected from the process.

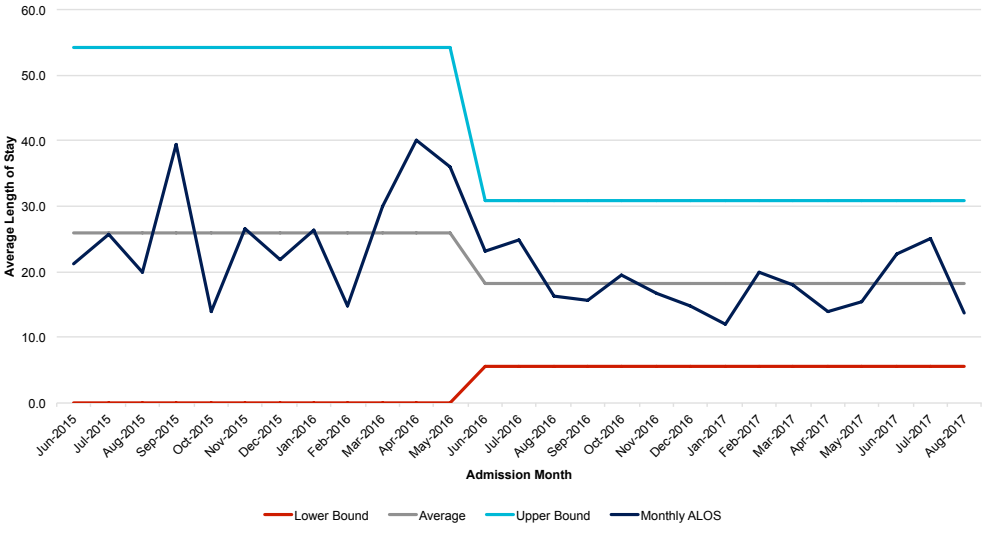
The process was considered at the three major sites providing treatment for stroke. The comparative process control charts are shown in **Figure 3**. As per **Figure 1 and 2,** the results shown in **Figure 3** relate to patients with a cerebral infarction ICD-10 classification I63) who were discharged home and allocated to DRG B70B.



Hospital A: Process Behaviour Chart – STROKE & OTH CEREB DIS +SCC (patients discharged home)



Hospital B: Process Behaviour Chart – STROKE & OTH CEREB DIS +SCC (patients discharged home)



Hospital C: Process Behaviour Chart – STROKE & OTHER CEREB DIS + SCC (patients discharged home)

Figure 3: Comparative process control charts for stroke patients discharged home at Hospitals A, B and C.

The data suggests that the process at all sites has changed, but this change occurred at different times for each site, namely in in August 2015 and October 2016 for Hospital A, in January 2016 for Hospital B, and in June 2016 for Hospital C. The control charts indicate that for the most part variation was within the expected limits, but that the processes were different at each site. The variation exceeded the expected process once at Hospital A, at the commencement of the second change in process and then returned to normal. The variation exceeded the expected range at Hospital B once, but no additional data was analysed and therefore the ongoing stability of the process cannot be confirmed.

The differences in processes at each site are supported by the profile of the average hours of care provided in different wards, as shown in **Table 4**.

Table 4: Average ward hours (for defined stroke patient subpopulation) for 2017 at three main sites

Average Ward Hours	Hospital		
	A	B	C
Stroke	67	90	0
Cardiovascular/Coronary Care	6	4	0
Critical/Intensive Care	0	0	0
General/Medical	13	27	0
ED	4	2	0
Rehabilitation	0	0	340
Surgical	1	0	0
Other	3	8	37

It is evident from the profile of average hours that differences in the process of care provided at each site existed, as shown in **Figure 3**. The process of care at Hospital C is noticeably different from that of Hospitals A and B as both **Figure 3** and **Table 4** show. Hospital C focused on the provision of rehabilitation, while Hospitals A and B were providing acute patient care.

The additional descriptive analysis conducted as part of the evaluation work has not been reported, as the key analysis relates to the process control charts.

5.2. Qualitative Results

The available sample was 20 potential clinical leads and six clinical leads volunteered and consented to being interviewed. The overall response rate was 30% of the available sample. While the actual sample was small, so was the available sample. All clinical pathways were represented (**Table 1**), however not all LHNs (**Table 2**) were represented. Interviews ranged in duration from 15 to 50 minutes. All interviews were conducted face-to-face by the same interviewer at various SA Health locations across Adelaide during a three month period (February - April 2018).

Table 5: Available and actual sample by clinical pathway

Clinical Pathways	Available N	Actual N
Rehabilitation	5	2
Orthogeriatrics	6	1
Acute Coronary Syndrome	4	2
Stroke	5	1
Total	20	6

Table 6: Available and actual sample by LHN

LHN	Available N	Actual N
NALHN	5	3
SALHN	5	2
CALHN	6	1
CHSALHN	2	0
SAAS	2	0
Total	20	6

The main findings from the data collection are described below.

Please note: The numbers in brackets after the quotes refer to the interviewees

5.2.1. Understanding innovation

Innovation was seen by one clinical lead as *"trying to do things better … equalise some of the services, create new services where they haven't been any before, and to develop … services across the system"* (5) by two others it was seen as *"new and more efficient pathways … to create consistency and efficiencies of care"(4),* and "*new system designs"* (6). Innovation was considered as a 'change process' by another clinical lead whereby the best available evidence was a reference point and current practices were evaluated against the evidence; and as a result *"you assess, design, plan and implement better ways of doing things' so ultimately 'designing a better health care system"* (2).

5.2.2. Use of innovation as part of Transforming Health

In reference to innovation and Transforming Health, a clinical lead specified the focus on 'clinical innovation':

> *"So regarding innovation, Transforming Health was – well, my view of the term innovation really should be clinical innovation. There were really two clear parallel arms of Transforming Health that needed to be implemented at the same time and one of them was really a reduction of bed stock. The second one was to try and gain efficiency through innovation in how we deliver care"* (1).

Another clinical lead supported the intention of innovation in Transforming Health as seeking efficiencies:

> *"Massive financial imperative to reform health care in SA and I was comfortable with that because I consider that a perfectly valid reason… there were some things within SA which seemed manifestly illogical like having 8 ED [Emergency Departments] working 24 hours a day for a population of 1.5 million…you sort of knew there must be other gross inefficiencies around the place as well"* (3).

So the notion of innovation was used in Transforming Health as a means of seeking 'economic efficiencies'.

A clinical lead commented that Transforming Health did not really create a culture in which innovation could be nurtured. The timing and demands required as part of Transforming Health including service restructures; organisational change; staff and service moves was considered by this clinical lead as not conducive to innovation. It is only now, post the Transforming Health 'chaos' that they feel able to engage in innovation safely (3).

5.2.3. TH as a means of delivering innovation?

There were many projects implemented as part of Transforming Health. When asked about the innovations introduced as part of Transforming Health the following clinical innovations were described by clinical leads: a decision pathway for the emergency department assessment of patients with undifferentiated chest pain; centralised services that has resulted in an increase in access to endovascular therapy for stroke; care passports which include a copy of the patients' discharge summary and future treatment requirements and the expansion of tele-rehabilitation to expand the delivery of rehabilitation out into the community. Another clinical lead was more cynical about the concept of innovation adopted through Transforming Health stating:

> *"We didn't do anything. We just looked at what the modern evidence-base was and said we are not doing this at the moment and we need to be doing that. So it wasn't innovative it was a matter of just taking the best available models that were already well embedded [elsewhere] … we were at the forefront of adopting the most contemporary models of care" (3).*

For a model of care while there have been improvements on some metrics for example length of stay in their hospital, the *"metrics of time to treatment,... hasn't been quite as good as we expected, and we're looking at that as to why that hasn't been the case"* (6).

For one model of care the process of innovation to improve efficiencies in clinical pathways had occurred prior to Transforming Health, a clinical lead stated:

> *"We had conducted that process without Transforming Health, I want to make that very clear. We had no support from Transforming Health, we conducted those changes in an evidence-based manner without any support…we implemented those reforms and have good evidence that they have both improved care, efficiency and outcome and published that work" (1).*

In addition, the failure to roll out a consistent model of care across the metropolitan region resulted in a clinical lead declaring that the Transforming Health innovation was not successful:

> *"So regarding innovations that did not work, I can't really comment on anything that didn't work only because I don't know. There were issues with the [LHN] because they didn't – they felt that they wanted to do it their own way, they didn't want to engage and I can't say that they're wrong. I can only say that it would be nice to have a standardised process across the State" (1).*

There were some innovations that were not supported as part of Transforming Health. A randomised clinical trial to increase efficiencies and effectiveness of patient care was not supported as part of Transforming Health. This clinical lead stated: *"They actively said that they didn't want it to be seen that we were using the TH to fund or support research, despite that fact that the model, the research model was about trying to achieve greater efficiency and effectiveness in the emergency department"* (1).

5.2.4. Governance for innovation

The loss of clinical networks as part of Transforming Health was mentioned by some clinical leads. A clinical lead commented that the type of governance required for Transforming Health to be successful involves more decentralised local control, autonomy and decision-making management such that when the clinician can control the entire journey locally, they can find efficiencies. The clinical lead stated:

> *"Other units or other parts of the service have greater difficulty in getting things done because they are dependent on the responsiveness of other units/service. Realizing efficiency and effectiveness will require a re-engineering of the inter-departmental and service level accountability of the components of the patient journey" (1).*

So while this clinical lead was able to achieve innovation and efficiencies in their model of care, they recognised that other models of care do not have the same ability to be innovative and responsive.

One clinical lead reflected on the missed opportunities of Transforming Health: *"the big structural changes that could really transform, properly transform SA Health, is the overall idea that you need three acute hospitals supported by three sub-acute hospitals"* (6). In addition *"I think the other big transformation that needs to occur in SA Health is around medical leadership and the health bureaucracy"* (6). Whereby medical leadership is harnessed and they bridge the divide between bureaucracy and practice to drive change. The clinical lead reflected that the 'fly-in fly-out' bureaucracy had very little credibility amongst the medical staff.

5.2.5. Evidence-based practice

In relation to the development of models of care, there was shared support across all clinical leads for using the best available evidence-base to inform the development of their model of care. While some clinical leads did not name this as 'innovation', it was considered best practice and what 'should' be happening.

Most clinical leads perceived disparities between LHNs as part of Transforming Health; in relation to the models of care adopted across LHNs and the level of infrastructure investments across the sites. In relation to the model of care on the same clinical pathway across LHNs, a clinical lead stated: *"My concerns were it [the model of care was] founded on the [X] model… it's not that I felt that there was something inherently wrong with the [X] model, but it seemed to … always default back to that model, as opposed to something new and innovative that was a new pathway…"* [emphasis added] (4).

For this clinical lead the shared model of care needed to be 'new', rather than adopting the model of care that had been tested and proven in another site, even though this was evidence-based. Rivalry was evident between the sites through the refusal by one site to adopt the same model of care as another, even though it was an evidence-based model of care.

The other rivalry identified pertained to differences in investments between LHNs on the same model of care. For example clinical leads stated:

> *"Yes, we've had Transforming Health but our version is the budget version, and they've got the Rolls Royce version…[they've] invested but nowhere near as much as the other*" (5).
>
> *"It was a lot of resistance from certain personalities at [LHN] at the time, which was sort of the perception that Transforming Health was stealing activity and making [LHN] less important..."*(4).
>
> *"We all have our potential patch and empire we want to preserve"* (6).

These real or perceived disparities suggest a strong culture of competition and power struggle between LHNs as compared to an environment that might foster a culture of equitable distribution of resources and shared improvement for the safety and best outcomes for all patients across South Australia.

Evidence-based practice was seen to be premised upon strong connections between clinical practice, research and teaching. One clinical lead stated: *"It's not just patient care, it is also teaching and research as part of a health unit's mission. All of those three go together and you need to support all three of those to create a good environment for the hospital, they reinforce one another"* (6).

Professorial links with a University were considered to be an advantage for innovation, continual improvement and evidence-based practice. As one clinical lead stated:

> *"Links to the university resulted in the review of 'what's best practice elsewhere, and making sure that we've got a health system, a health service that's as equal to anything that you'll find anywhere really"* (2).

> *"We want to improve the system of care for patients, and how do we best do that in a way that does balance training and research and as well as patient care at the three major hospitals"* (6).

Not all metropolitan hospitals have established links with universities and this was considered a distinct disadvantage for fostering clinical innovation and promoting evidence-based practice, as another clinical lead stated: *"There needs to be some chairs set up in the north…if you had a professorship…then you start to get some kudos. [At the moment] … it's not a real service… doesn't have any professors, it doesn't have a strong links to the university, and so it's not a real service…"* (5).

While there was strong in principle support for evidence-based practice in the development of the models of care, the movement and closure of hospital services were not considered to be evidence-based decisions. One clinical lead stated: *"the transition of services wasn't really an evidence-based thing that was really just, there was a decision"* (2). In terms of putting the service moves into action, staff were supported to use a range of evidence to ensure that the moves were as safe as possible and all the potential risks were mitigated. The evidence was not always scientific and included visits to other interstate sites which had undertaken service moves recently to ensure the best available information guided the moves.

5.2.6. Data, simulation and modelling

Integrally linked to evidence-based practice is data and data access. The area with the greatest shared ground between clinical leads was the need for timely accurate data to inform practice and decision-making. All those interviewed shared concerns over health data. Issues raised included: ongoing and real-time access to data and health information to improve current practices, patient outcomes and inform decision-making; and accuracy of the data used to mount the case for Transforming Health.

One clinical lead stated: *"We don't know how well we're doing on these things [models of care] because we don't have a structure to be able to measure whether or not we do well… a deficiency that we have [is] relatively poor data access to allow appropriate,… to inform decisions"* (1).

There was shared support for ensuring data systems were consistent across sites and collecting what is needed to ensure better patient care and to help identify efficiencies in the new models of care.

Issues were raised about the quality of SA Health data and the immediacy of access to data and health information to inform clinician's decisions. A clinical lead stated: *"we need to be generating high quality data and feeding it back to clinicians in real time"* (3). Another clinical lead stated: *"so it is still a deficiency that we have relatively poor data access to allow appropriate analyses to inform decisions"* (1).

The ability and capacity of all clinicians to undertake the analysis required was raised as a short-coming; as was the need for aligning the priorities regarding their analysis requirements with the strategic directions of the health unit: *"… a clear connection between strategic importance and resource allocation towards data allocation and analysis"* (1). A clinical lead raised that if efficiencies are required then clinicians also need access to their financial data to inform their decisions: *"It's all very well to say the cost of your service is too high but unless you can provide that data and explain where the money flows in the system, it's unreasonable to expect people to really change their behaviour"* (3).

Some models of care reported having progressed further along the path to be able to monitor the standards of care relevant to their model of care. A clinical lead identified that their model of care now, in effect, has a 'scorecard' that they can use to improve the quality of their service:

> *"The data points that we already collect to actually monitor standards of care … we're at the beginning stage now where we actually get together as a collective, to actually review what the results are… the quality driver as well depending upon the results that you get, if somebody else has got a better result than you, you can quiz them, what are they doing that's different to what you're doing… it's a mechanism to actually improve by comparing and benchmarking"* (2).

There is evidence that some models of care are beginning to receive the health information they need to monitor progress and make changes where required. This is not consistent across all models of care. In response to being asked about modelling some clinical leads referred to the modelling undertaken by the contractors in preparing the groundwork and 'case' for Transforming Health. The models that were used to support the service moves were questioned as the assumptions that the models were based upon were not made transparent:

> *"Modelling is basically a way of guessing what's going to happen… but the model was never presented in such a way that we would have the opportunity to challenge the model and in fact, challenging the model probably wasn't encouraged partly because that would have delayed the whole thing and everything had to be done very, very quickly…modelling is very, very powerful but the model needs to be transparent as well"* (3).

One clinical lead referred to their reliance on the modelling undertaken centrally for their model of care. However the modelling indicated that there would be, on average one event per night across Adelaide and so service restructure and staffing decisions were made on the basis of this information. The result of relying on the average is that *"It's an underestimated activity to a certain extent. Activity has been more than one, it ended up sort of 1.5-2 [events] per night, so it was an underestimate"* (6). No clinical leads referred to their use of modelling in relation to their own clinical practice or care pathway nor did any clinical leads expand on their use of simulation as part of Transforming Health.

6. Discussion

6.1. Variation in Process and Patient Flow

As identified in the quantitative method, the extent to which the evaluation has been performed was limited to consider the variability in the process of providing care to patients who experienced a stroke. In order to control for some expected variation, the cohort of patients included in the analysis was limited to those patients:

- Who were discharge home
- Experienced a cerebral haemorrhage (ICD-10 code I-63), and
- Were classified to DRG B70B (stroke and other cerebral disease + severe complications).

Those involved in the provision of stroke care may have advocated for further restrictions or compartmentalisation of patient groups to further reduce variation. However, the intent of this analysis was to look at the process for a group of patients that would be expected to be treated by the service.

The method of process control charts provided a method that enables visualisation of variation and also the identification of periods when the process could be considered to be outside normal bounds of operational expectations. As Neuhauser, Provost, and Bergman (2011) have identified, variation in observations is to be expected. Indeed, unlike a production process environment where only uniform products are being made, health is dealing with patients and patients vary – and therefore the care they receive will also vary. Thus, we should expect to see variation.

It was evident from the Control Charts and the descriptive profile of ward use that:

- Variation in process – based on patient stay – existed
- Changes in the "system" occurred
- Changes at individual sites occurred
- The processes at individual sites are different – based on the length of stay (see Figure 3) and further evidenced by the use of different wards (see Table 4 e.g., rehabilitation at Hospital C)
- Almost all variation was within normal expectation
- Only two events that fell outside the normal expectation were observed, and
- The bounds of variation for the processes (as a system and at individual sites) improved (i.e., there is evidence that patient flow improved).

The differences in the way in which care is provided at different sites reflects decision-making that has not been considered as part of the evaluation. The provision of acute patient care at Hospitals A and B is different to providing rehabilitation for patients at Hospital C, and there are differences in the process at Hospitals A and B. That is all that can be derived from the findings. No attempt at considering the impact of different service processes was made.

While changes in the process of care can be observed and the approximate timing of the change of process identified, it is not possible on the basis of the analysis of the data alone to attribute the cause for the change to activities relating to Transforming Health. To do this would require significant additional investigation which is beyond the scope of this exercise.

6.2. Flexibility of Services to Deal with Variation

While it would have been useful and interesting to consider the ability of services to deal with variation in service beyond what can be garnered from the Control Charts Method, it is not possible on the basis of the analysis of the data to form an opinion on this issue. To do this would require significant additional investigation which is beyond the scope of this exercise.

6.3. Planning for Change – The Use of Simulation

Noon et al. (2003) recognised that in order to pursue the delivery of better health services it is important for health care providers to understand the role of variability and that is possible to model such variability. Don Berwick, a physician and co-founder of the Institute of Healthcare Improvement (IHI see www.ihi.org) wrote: Every system is perfectly designed to achieve the results it achieves Berwick (1996, pg. 619). When planning and evaluating change it is important to remember not only Berwick's sage words, but also those of ascribed to HL Mencken, who stated: For every complex problem there is an answer that is clear, simple, and wrong (Ehrenfeld, 2015). In pursuing the implementation of significant change, it is important to recognise that variability can and should be modelled. Indeed, simulation tools now exist that enable the detailed modelling of health services. Simulation enables the creation of a model that reasonably resembles the system of interest to be tested on a computer prior to its actual implementation. This significantly reduces the risk associated with such change and enables the testing of a greater range of solutions. To embark on any significant change without such modelling means that variation cannot have been reasonably accounted for and nor can a range of possibilities. Such modelling has been previously undertaken overseas in relation to stroke and was found useful in designing a service that was able to treat four times as many stroke patients in half the time and achieved better outcomes for patients (Monks, 2015).

There were insights from the qualitative evaluation, when clinical leads referred to their concerns with the central modelling, that no clinical leads used modelling or simulation to improve patient outcomes as part of Transforming Health. Given these insights, combined with the evidence-base supporting the added value of simulation and modelling, it would seem to be a missed opportunity that Transforming Health was not predicted upon sophisticated simluation. Such modelling would have enabled the evaluation of predicted changes in service delivery to have been evaluated against scenarios that would have been tested with rigour prior to implementation.

In future, it is hoped that SA Health employs simulation or other appropriate modelling tools prior to any such significant reform.

6.4. Innovation, Evidence-base and Data

The qualitative systems evaluation of Transforming Health has sought insights from clinical leads into answering the following two questions: In what ways has Transforming Health promoted innovation to improve system performance? And in what ways has Transforming Health enabled the system to use different types of evidence to deliver high quality patient care?

In their realist review of large-system transformation in health care, Best et al (2012) identify five simple rules for large-system transformation:

1) Engage individuals at all levels in leading the change efforts

2) Establish feedback loops

3) Attend to history

4) Engage physicians

5) Involve patients and families (p. 442).

Managing large scale health system change across multiple sites provides many challenges and opportunities and TH has been a courageous program of change. Of the five simple rules in large system change, this evaluation has identified insights into the application of these simple rules as part of the Transforming Health evaluation, in particular rules 1-4.

Establish feedback loops. Feedback loops in their sense refers to the 'identification of measures and the judicious disclosure of those measures to those both inside and outside the organisation' (Best et al 2012: 437). There was agreement amongst all clinical leads on their need for data (or health information) access in real-time to inform decision-making and support the identification of efficiencies. Given the relatively short time period for Transforming Health a large-system change program it was not surprising that not all SA Health sites and models of care were able to experience the same progress towards monitoring and data access. Some models of care had experienced delays and problems in data access and analysis, while others had realised the real-time scorecard to health information which allowed them to monitor their own progress against other sites. Sustainability in the provision of this access to data and health information is required to ensure the ongoing monitoring of models of care across all sites. Concerns were raised by clinical leads that the system changes may quickly revert back to pre-Transforming Health.

Attend to history: Inconsistencies in care between LHNs were reported for example in the development and uptake of models of care and the levels of investment in infrastructure. As part of Transforming Health there was in principle support for evidence-based practice in the development of the standardised models of care across sites, this however did not happen in practice. As mentioned above, one site claimed to be further advanced in the development of a model of care and had contributed to building the evidence-base for this model of care prior to Transforming Health. In the process of development of a consistent model of care across all sites, this advanced development resulted in a lack of shared ownership of the model of care across LHNs and the outcome was the development of what was described as a more 'generic' model of care. While some models of care had developed an evidence-based model of care prior to Transforming Health, for other models of care Transforming Health provided the opportunity to develop an evidence-base for their model of care and test innovative clinical solutions.

The disparities between hospitals in relation to innovation and evidence-based practice were partly attributed to their links (or lack thereof) with universities. The opportunities for some clinicians such as professorships and hospitals being seen as centres of teaching and research excellence furthered the sense of inequity between sites. Had Transforming Health attended to the history and context across the various sites and models of care, this issue may have been addressed and resulted in more consistent up-take of innovations across sites.

Engage individuals at all levels in leading the change efforts and engage physicians: Innovation was seen by clinical leads as a way to both seek efficiencies within the hospital system and improve consistency in patient care and health outcomes across sites. Some models of care were successfully able to innovate across the multiple SA Health sites during the Transforming Health change program, while on occasion site-specific rivalry or competition inhibited other models of care from achieving this outcome. A need for governance systems which allowed decentralised local control and decision-making to support staff to innovate; or find efficiencies and improve patient care was identified.

A combination of local governance and decision-making; supportive organisational culture; attending to the history and context of particular sites; improved access to data and health information; and time to support the substantial Transforming Health change program were identified as being important for the success of innovation and evidence-based practice in Transforming Health. Not all of these were addressed through the Transforming Health change program. The Transforming Health change program included service moves, infrastructure builds, staff movement, development of models of care and other project-based innovations were being undertaken over a relatively short period of time, which created great flux and the clinical leads saw this as potentially antithetical for the safe implementation of clinical innovation. Even within this context, some sites and hospitals were able to engage in the Transforming Health change program and engage in clinical innovation and evidence-based practice.

7. Limitations to the Systems Evaluation

7.1. Delays in the Evaluation

As the evaluators involved in this component of the evaluation were included in the project after its commencement delays were experienced, particularly in relation to securing the required ethics approval. Consequently, this has resulted in a reduced period of time to analyse data and also to secure participation of and interview participants/respondents/interviewees.

7.2. Findings Made by Others

Other organisations, such as the Health Round Table and the Stroke Foundation also release information regarding the performance of South Australian hospitals. The work of the Health Performance Council and Auditor-General's Office was mentioned earlier in this report.

A normal evaluation would consider the findings made by others, as it can be a useful means of corroborating findings (this is known as triangulation). To do this would require significant additional investigation and also permission to access reports (e.g., Health Round Table) which is beyond the scope of this exercise.

7.3. Normal Evaluative Process

While it has already been mentioned earlier in this that report the resources for this work have been limited, it is also important to detail the limitations of what has been undertaken in this particular component of the exercise. Given the extent of the Transforming Health reforms, a normal evaluative process would not:

- Rely upon few interviews for the qualitative component of this work
- Be restricted to the single process of care (i.e., stroke) for the quantitative component of this work
- Exclude the work undertaken by others (see the section on findings made by others), nor
- Not engage with those delivering the change and exclude them from consideration of the findings prior to release i.e., analysis of the data alone provides insufficient context to enable any attribution of any change identified through such analysis to a particular source.

Consequently, the authors recommend that the findings be interpreted with caution.

8. Conclusions

The use of the process control charts was a convenient way in which to explore variation in the system and to examine if patient flow, as shown by the average length of stay, had improved. As the health system is dealing with patients and patients vary, variation was expected. The findings confirmed that variation in process existed and that changes in the system and at individual sites occurred. Attribution of the changes to Transforming Health, however, was not possible.

There are tools that can facilitate the modelling of variation in services – namely simulation. The use of such methods would have significantly reduced the risk associated with planning for such change and also enabled the testing of a greater range of solutions. Given the insights from the qualitative evaluation where no clinical leads used modelling or simulation to improve patient outcomes as part of Transforming Health, combined with the evidence-base supporting the added value of simulation and modelling it would seem to be a missed opportunity that Transforming Health was not predicated upon sophisticated simulation. Such modelling would have enabled the evaluation of predicted changes in service delivery to have been evaluated against scenarios that would have been tested with rigour prior to implementation. In future, it is hoped that SA Health employs simulation or other appropriate modelling tools prior to any such significant reform.

There was a range of responses from clinical leads on the role and purpose of innovation in Transforming Health. Clinical innovations were primarily seen as a way of seeking efficiencies and increasing consistency in health service delivery and health outcomes across various sites. Innovations were described as resulting from Transforming Health and there were some innovations that were reported to have been implemented prior to Transforming Health, others felt unable to innovate safely in a climate of change resulting from Transforming Health. Rivalries were evident between sites, especially in relation to the level of infrastructure and resources distributed through the implementation of Transforming Health. On some occasions these site-based rivalries resulted in Transforming Health not achieving consistent models of care across sites.

All clinical leads supported the use of the best available evidence-base in the development of the models of care. In addition, all clinical leads discussed the importance in having the timely availability of data and health information to provide immediate monitoring. A clinical lead interviewed from one model of care was able to discuss the scorecard that they can now access, resulting from Transforming Health. During Transforming Health other clinical leads representing different models of care did not have the same success in their access to timely data and health information to inform their clinical practice and seek improvements and efficiencies. Research and professorial links with universities based in hospitals were seen to be advantageous in supporting clinical innovation and contributing to the evidence-base.

There are several limitations to the systems evaluation, the limited timelines, delays with ethics approvals, the inability to further explore the differences in the way in which care is provided at different sites and the lack of discussion with service providers, the focus on only one model of care in the quantitative component and small sample size in the qualitative component mean that the findings from this study are in no way representative, should not be generalised and should be treated with caution.

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10. Appendices

Appendix 1: Transforming Health Evaluation: System Outcomes

Semi-structured interview schedule

Introductory questions (background of the interviewee) include:

1) What was your role in hospital/health service before TH?

2) What was your role in hospital/health service during TH?

3) Length of service with SA Health

4) What particular TH projects have you been involved in?

The following questions are about innovations, modelling and the use of evidence-based information in the work you've been involved in around Transforming Health.

A: Innovation

1) How do you understand the term 'innovation' as it relates to Transforming Health?

2) To what extent did your Transforming Health projects involve innovation?

3) Give me some examples of how you were able to innovate.

PROMPTS: What were the innovations implemented? What was the origin of the innovations? What were the results of the use of innovation? Where did the innovation work well? Where did the innovation not work so well?

B: Data and modelling

INTRO TEXT TO BE READ OUT: In addition to innovations, we are interested in understanding how data and modelling (which means simulating or testing scenarios before implementation) may have been used in Transforming Health.

1) Tell us how data and modelling were used for the introduction of a Transforming Health project within your work area.

IF IT WAS NOT USED, THEN ASK…

2) Are you aware of data or modelling that could have been used?

3) What do you think would be necessary for the adoption and greater use of data and modelling?

4) What do you think would have been appropriate to use?

IF IT WAS USED, THEN ASK…

5) Please describe the measures and approaches used

6) In your view, were they suitable?

7) What would you have done differently?

C: Evidence-base practice

INTRO TEXT TO BE READ OUT: There are a range of types of evidence (with differing quality) used to inform practice in healthcare.

1) What sorts of evidence did you (and others) use to inform the new practices you introduced through Transforming Health?

2) What were the barriers to using this evidence?

3) What were the enablers in the system that helped you get this evidence into practice?

PROMPTS: Was evidence-based practice encouraged and valued?

D: Generic

1) If you could do Transforming Health again (and the development and roll out of your Model of Care), what would you do differently? And what would you do again?

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