

# Report of the Auditor-General

Report 16 of 2020

Review of ICT projects  
in SA Health

---

Delivered to the President of the Legislative Council and the Speaker of the House of Assembly on 8 December 2020 and published on 10 December 2020 pursuant to section 38(2) of the *Public Finance and Audit Act 1987*

---

Second Session, Fifty-Fourth Parliament

By authority: S. Smith, Government Printer, South Australia

---

*The Auditor-General's Department acknowledges and respects  
Aboriginal people as the State's first people and nations, and  
recognises Aboriginal people as traditional owners and occupants of  
South Australian land and waters.*



**Auditor-General's  
Department**

[www.audit.sa.gov.au](http://www.audit.sa.gov.au)

Enquiries about this report should be directed to:

Auditor-General  
Auditor-General's Department  
Level 9, 200 Victoria Square  
Adelaide SA 5000

ISSN 0815-9157



8 December 2020

Level 9  
State Administration Centre  
200 Victoria Square  
Adelaide SA 5000  
Tel +618 8226 9640  
Fax +618 8226 9688  
ABN 53 327 061 410  
audgensa@audit.sa.gov.au  
www.audit.sa.gov.au

President  
Legislative Council  
Parliament House  
ADELAIDE SA 5000

Speaker  
House of Assembly  
Parliament House  
ADELAIDE SA 5000

Dear President and Speaker

**Report of the Auditor-General:  
Report 16 of 2020 Review of ICT projects in SA Health**

As required by the *Public Finance and Audit Act 1987*, I present to each of you Report 16 of 2020 Review of ICT projects in SA Health.

**Content of the Report**

Each year we review agency security controls over IT systems and the status of selected IT projects.

This report communicates the results of the following key IT reviews we conducted in 2019-20:

- Enterprise Pathology Laboratory Information System project
- Electronic Medical Record project.

**Enterprise Pathology Laboratory Information System project**

Most of the Enterprise Pathology Laboratory Information System post-implementation issues are now either fully or partially addressed. Some Optimisation Project activities are ongoing, including improving data entry screens and billing processes, and trialling error notification software. Work is also being done on pathology instrument interfaces to improve the efficiency of specimen testing and enable electronic ordering for sites still operating the legacy Open Architecture Clinical Information System.

Another project has commenced to allow external general practitioners to electronically order pathology tests and improve the process to receive results.

## **Electronic Medical Record project**

Our review noted that since our last status update, SA Health has made several system enhancements to Electronic Medical Record and has completed its implementation at two exemplar sites. This includes making improvements to the Electronic Medical Record user interface, changing process workflows and integrating with the Commonwealth Government's My Health Record system.

Since May 2020 the SA Government has approved an additional \$204.4 million for the Electronic Medical Record Project to complete the rollout to the remaining in-scope metropolitan sites through to June 2023.

Our review noted the following challenges for the project:

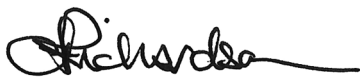
- tracking all project benefits
- updating the budget estimate to complete the project
- getting user feedback
- addressing priority system configuration and development issues
- implementing a future billing solution
- resolving system configuration and defects
- replacing the current mobile device solution
- improving medical record scanning
- maintaining sufficient project resourcing
- Flinders Medical Centre implementation complexities.

## **Acknowledgements**

The audit team for this report was Andrew Corrigan and Tyson Hancock.

We appreciate the cooperation and assistance given by staff of the agencies involved in these reviews.

Yours sincerely



Andrew Richardson  
**Auditor-General**

# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
<b>2</b>	<b>Enterprise Pathology Laboratory Information System Program</b>	<b>1</b>
2.1	Executive summary	1
2.1.1	Introduction	1
2.1.2	What we found	1
2.2	Review objectives, scope and approach	2
2.3	Enterprise Pathology Laboratory Information System Program background	2
2.3.1	Initial Enterprise Pathology Laboratory Information System rollout	2
2.3.2	Optimisation Project initiation and scope	3
2.3.3	Optimisation Project status and outcomes	4
2.4	System challenges and hospital impacts	5
2.4.1	Billing issues	5
2.4.2	Turnaround times for pathology test results	6
2.4.3	External general practitioners ordering and reporting to maintain private revenue	7
2.4.4	COVID-19 impacts	8
2.5	Project budget and expenditure	8
<b>3</b>	<b>Electronic Medical Record Project</b>	<b>9</b>
3.1	Executive summary	9
3.1.1	Introduction	9
3.1.2	What we found	9
3.2	Review objective, scope and approach	10
3.3	Electronic Medical Record Project background	10
3.4	Implementation outcomes at two exemplar sites	11
3.5	Project budget and expenditure	12
3.6	Electronic Medical Record key process improvements	13
3.7	Future implementation plans	13
3.8	Update on current project activities	14
3.9	COVID-19 impacts	15
3.10	Current program challenges	16
	<b>Appendix – Glossary of abbreviations and terms</b>	<b>23</b>



# 1 Introduction

Each year we review agency security controls over ICT systems used in SA Government agencies and the status of a number of major ICT projects.

This report communicates the results of the following SA Health ICT reviews we conducted in 2019-20:

- the Enterprise Pathology Laboratory Information System (EPLIS) Program
- the Electronic Medical Record (EMR) Project.

The Auditor-General has the authority to conduct these reviews under section 36(1)(a)(iii) of the *Public Finance and Audit Act 1987*.

## 2 Enterprise Pathology Laboratory Information System Program

### 2.1 Executive summary

---

#### 2.1.1 Introduction

EPLIS was implemented to standardise end-to-end pathology workflows and replace a legacy laboratory pathology system that was increasingly problematic and costly to support within the Department for Health and Wellbeing (SA Health).

We last reported on the status of the EPLIS Program in June 2017,<sup>1</sup> when we reviewed the process being used to roll EPLIS out to several metropolitan hospitals, regional laboratories and collection centres.

At that time the implementation of some EPLIS functionality was limited to the Women's and Children's Hospital (WCH). The full rollout was due by May 2017, but was not completed until April 2018.

After implementation, the EPLIS sites experienced several ongoing issues, and SA Health initiated a separate Optimisation Project to resolve them.

#### 2.1.2 What we found

Most of the EPLIS post-implementation issues are now either fully or partially addressed. Some Optimisation Project activities are ongoing, including improving data entry screens and billing processes, and trialling error notification software. Work is also being done on pathology instrument interfaces to improve the efficiency of specimen testing and enable

---

<sup>1</sup> Supplementary Report of the Auditor-General for the year ended 30 June 2016 *Enterprise Pathology Laboratory Information System: June 2017*.

electronic ordering for sites still operating the legacy Open Architecture Clinical Information System (OACIS).

Another project has commenced to allow external general practitioners to electronically order pathology tests and improve the process to receive results.

## 2.2 Review objectives, scope and approach

---

The purpose of our review was to obtain an update from SA Health on the outcomes of the EPLIS Program, including the overall project spend, expected benefits and any key challenges impacting current operations.

We also sought an update on the remediation of issues arising from the implementation of EPLIS at hospital sites and activities that have occurred since program closeout.

As this was a high level review, we relied on the information provided by SA Health and did not seek supporting evidence to validate these responses. We did not perform detailed control testing, evaluate system usability or review any processes specific to the COVID-19 outbreak.

## 2.3 EPLIS Program background

---

### 2.3.1 Initial EPLIS rollout

The EPLIS rollout was originally scheduled to be completed in May 2017. This was delayed due to other SA Health priorities, such as completing the Royal Adelaide Hospital (RAH) and closing out the EPLIS Program planning and design stage.

SA Health completed its EPLIS rollout to in-scope sites by the following go-live dates:

- Women's and Children's Hospital (March 2017)
- Frome Road Laboratories (June 2017)
- Royal Adelaide Hospital (September 2017)
- The Queen Elizabeth Hospital (October 2017)
- Flinders Medical Centre (December 2017)
- Regional sites (February 2018 to April 2018)
- Lyell McEwin Hospital (February 2018)
- Modbury Hospital (February 2018)
- Noarlunga Hospital (April 2018).

Functionality at these sites was progressively rolled out following the go-live dates. The EPLIS Program was closed out in April 2018. The closeout report identified several ongoing issues that needed to be addressed. These notably included:

- an increase in turnaround times from specimen collection to result availability. This was mainly due to an increase in data entry processes, delays in laboratory throughput and the inability to effectively track specimens



- a decline in customer satisfaction due to changes in reporting format, the timeliness of test results and delays in communicating and resolving issues
- a decline in revenue generation and collection due to insufficient prerequisite data to generate invoices, low staff familiarity with system functionality and high volumes of data that require manual intervention
- increased staff anxiety.

In May 2018, responding to concerns from clinicians and patients, the SA Government established a task force to specifically examine the reasons for these issues and recommend remedial action.

The task force commissioned an external provider to conduct an independent review, which was completed in June 2018.

The task force and the independent review identified several organisation structure issues, data entry processes and other technical issues such as pathology instrument interface incompatibilities as the major contributors to the delayed turnaround times. They also noted that the drop in productivity after implementing EPLIS was amplified by the many other major SA Health and SA Pathology activities that were occurring during implementation.

Some of the recommendations from the independent review, together with some SA Pathology identified initiatives, formed the basis for an additional EPLIS Optimisation Project (approved in September 2018).

### 2.3.2 Optimisation Project initiation and scope

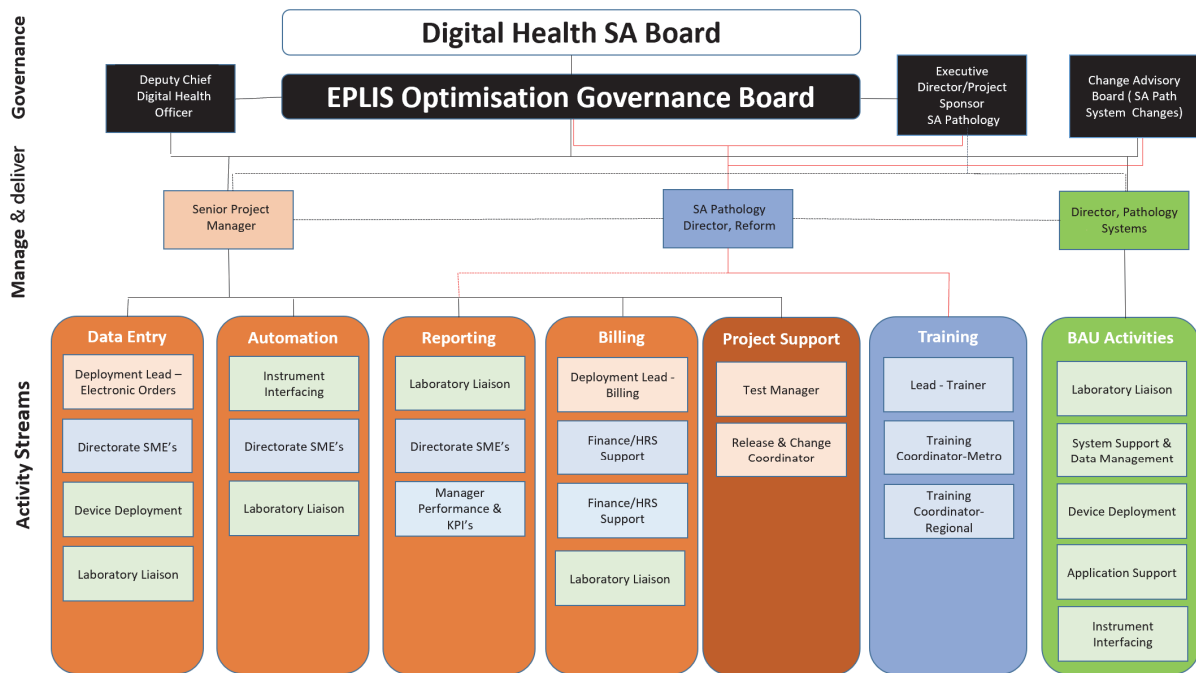
The EPLIS Optimisation Project was initiated in September 2018 with a focus on data entry, automation, reporting, staff training and billing. A separate Billing Remediation Project was also initiated in March 2019 to address growing billing issues (further discussed in section 2.4.1).

The Optimisation Project had three stages:

- **Stage 1:** optimisation (improvement) activities to address several business identified priorities
- **Stage 2:** technology changes to prepare for an EPLIS software upgrade that supports Windows 10 operating system compliance
- **Stage 3:** further activities to improve efficiencies by leveraging system enhancements from the system upgrade and addressing several known defects.

An organisation and governance structure was developed for the project with defined roles and responsibilities. The EPLIS Optimisation Governance Board has been responsible for monitoring its progress. SA Pathology advised that Digital Health's Program Management Office (ePMO) has also provided project guidance and monitoring to ensure there is sufficient reporting through to the Digital Health Board.

Figure 2.1: Optimisation Project governance model



Source: SA Health, July 2020.

### 2.3.3 Optimisation Project status and outcomes

The Optimisation Project was scheduled to finish in December 2019. However, due to system upgrade delays in February 2020 and impacts from COVID-19, it was extended for six months to July 2020.

SA Health advised us that one of the Optimisation Project's key achievements was upgrading EPLIS to the latest version. This major software upgrade was originally expected to occur in July 2019 but was delayed due to a significant number of system defects identified during testing. It was eventually implemented in December 2019. The issues identified during testing would have resulted in significant additional manual work for laboratory staff if not resolved. SA Health advised us that since the upgrade it had identified very few defects.

In addition, electronic ordering was implemented for the sites using the patient administration system, Electronic Medical Record (EMR). SA Health also expanded the use of EPLIS to several metropolitan Patient Collection Centres.

Automated validation of test results has been implemented against a clinical ruleset. If all conditions are met, the results will be automatically provided to the referring doctor, without human intervention. SA Health advised us that this workflow has been implemented for a broad range of tests which has increased efficiencies for new pathology orders.

While the Optimisation Project has achieved many of its intended outcomes, some activities are ongoing and have been transitioned to SA Pathology's business as usual operations. These include:

- further remediation of billing issues
- compliance with a new International Standard for Blood Transfusion
- interfacing with BloodNet to allow staff in health facilities across Australia to order blood and related products in a standardised, secure manner from the Australian Red Cross Blood Service. This initiative was dependent on a NSW Health pilot
- enhancing pathology instrument interfaces to increase the efficiency of specimen testing by reducing manual workflows
- pathology image viewing with SA Health patient administration systems
- OACIS electronic ordering direct to EPLIS.

## 2.4 System challenges and hospital impacts

---

After the initial completion of the EPLIS Program in April 2018, concerns were raised by clinicians and patients about several aspects of the pathology workflows. They mostly related to turnaround times for test results, customer dissatisfaction with reporting formats and billing issues due to additional manual data entry at the front end of the system.

In addition, ordering and reporting was not available to external general practitioners to maintain private revenue.

These issues are discussed in more detail in this section.

### 2.4.1 Billing issues

In our June 2017 Report, we noted that SA Health established a separate project to implement a new pathology billing system, Power Billing and Revenue Collection (PBRC), and interface it with EPLIS. Concerns were raised about the new billing solution, and at the time the extent of configuration effort was underestimated.

At the closure of EPLIS Program, several billing issues were still unresolved. Pathology staff identified that workloads had increased due to the extent of data entry requirements in EPLIS compared to the previous system.

SA Pathology estimated that 95% of transactions (approximately 10 000 per day) were processed in a timely way without manual intervention. Despite this, the remaining failed transactions were growing at an unmanageable rate, accumulating to over 270 000 encounters. SA Health advised us that the issues experienced were due to the quality of the data feeding into PBRC through electronic and manual processes, such as incomplete or incorrect information being fed/entered into the system.

SA Health advised us that EPLIS's initial reporting capabilities made it difficult to identify the reason(s) for the failed transactions, and that this had since been resolved.

A lack of available resources was contributing to delays in a resolution. Eventually a separate Billing Remediation Project was initiated to resolve the incorrect historical transactions, improve the source data quality, redesign the data entry screens and further improve reporting capabilities.

It took some time to resolve the historical billing errors by making configuration changes to both EPLIS and PBRC. Assistance was required from the relevant system vendors and additional temporary data management, billing and ICT resources were engaged. At the time of our 2020 review, SA Health advised us that:

- billing errors were still occurring, but at a significantly reduced rate. Removing the additional temporary resources may have some impacts on business as usual operations
- it was also trialling error notification software to help with the timely capture of data errors
- the software vendor was continuing to work on data entry screen enhancements to increase the accuracy of information entered
- SA Pathology recently simplified the Local Health Network (LHN) billing rules and made other improvements and workflow changes.

SA Pathology advised us that although there is no Commonwealth source revenue risk, as transaction resolution will be within the two-year Medicare cutoff,<sup>2</sup> LHNs have requested that all billing be processed within the financial year.

This is an ongoing challenge for SA Health as it continues to progress activities to reduce the daily billing error rate.

## 2.4.2 Turnaround times for pathology test results

After EPLIS was implemented there were delays in the turnaround time for patient pathology results. Several workflow factors contributed to these delays, including but not limited to:

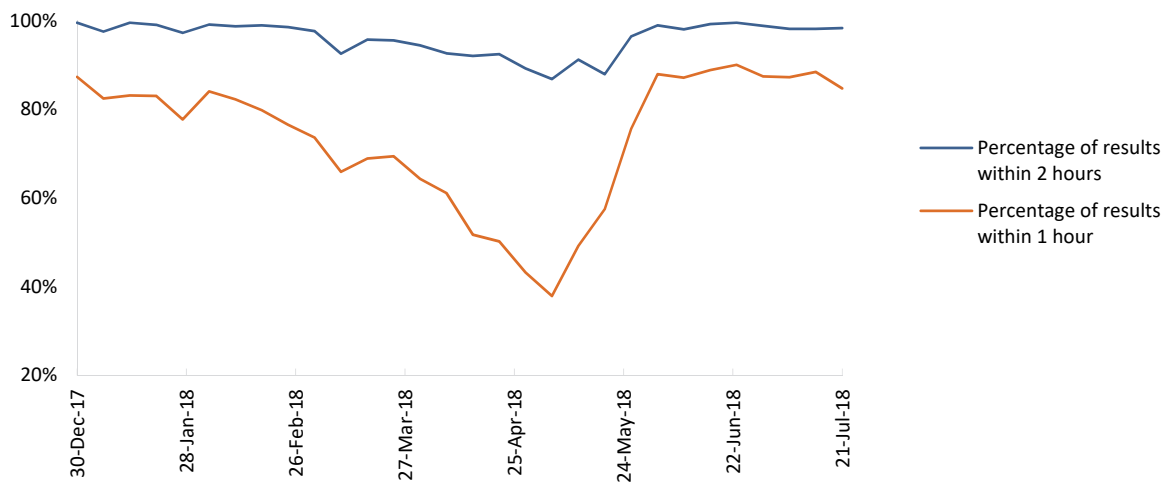
- a lack of electronic ordering capability
- additional order entry processes
- the use of new laboratory testing equipment
- the use of multiple laboratory systems and the volume of testing
- staff unfamiliarity (eg new site and system at the RAH).

These factors contributed to SA Health not being able to effectively track all specimens, further impacting turnaround times. Delays continued for another month after the EPLIS Program closed in April 2018 and were a key driver for establishing the Optimisation Project.

---

<sup>2</sup> Section 20B(2)(b) of the *Health Insurance Act 1973* states that a Medicare claim must be lodged within two years.

**Figure 2.2: Pathology patient turnaround times at the RAH from December 2017 to July 2018**



SA Health advised us that it was eventually able to reduce these delays by:

- implementing electronic ordering at sites running EMR<sup>3</sup>
- making data entry workflow changes as part of the Optimisation Project
- adding extra resources to resolve the backlog of patient orders and specimen information
- implementing EPLIS at metropolitan collection centres to process data order entries, to free up laboratory staff
- improved staff familiarity with the new workflows over time.

SA Health advised us that it is continuing to work on several improvements to further reduce patient turnaround times. These include additional data entry system changes, implementing electronic ordering for sites still operating OACIS and pathology instrument automation of specimen testing.

### 2.4.3 External general practitioners ordering and reporting to maintain private revenue

We first reported on the challenges associated with external pathology results in our October 2015 Report.<sup>4</sup> We noted then that a viable solution should be adopted as soon as possible to avoid erosion of SA Pathology revenue from private clinicians. Issues included pathology results being repeated when sent to external general practitioners. This activity has been an ongoing challenge for SA Health.

In January 2020 SA Health commenced a separate project to replace the current messaging component used to electronically exchange clinical documents between SA Health and the broader Australian healthcare provider community.

<sup>3</sup> Electronic pathology ordering from EMR is currently operating at the RAH, TQEH, Port Augusta Hospital, MGDHS, Noarlunga Hospital, old repatriation hospital clinics operating at the new Flinders Medical Centre building, Hampstead Rehabilitation Centre and Jamie Larcombe (Glenside).

<sup>4</sup> Supplementary Report of the Auditor-General for the year ended 30 June 2015 *Information and communications technology report: October 2015*.

This project includes several SA Health secure messaging workflows and is budgeted at \$3.6 million, of which around \$600 000 is allocated to pathology functionality. The project will be delivered in two phases:

- **Phase 1:** implement a new secure mechanism to send pathology results to external general practitioners
- **Phase 2:** ensure general practitioners can order pathology tests electronically (direct to EPLIS).

Phase 1 was originally planned to be delivered in September 2020 and Phase 2 in February 2021. However, due to the impacts of COVID-19, Phase 1 is now expected to be delivered in December 2020. At the time of this Report, SA Health was working through the detailed planning for Phase 2.

#### 2.4.4 COVID-19 impacts

SA Health understandably advised that the coronavirus pandemic, COVID-19, has created resource challenges. At the time of our discussions with SA Health, it had reportedly delayed some project activities by around six to eight weeks.

Subject matter experts engaged to work on stage 3 activities of the Optimisation Project were redirected to creating new test orders for COVID-19. This included making changes to existing COVID-19 orders to facilitate Medicare benefit claims.

SA Pathology ICT resources were also directed to activities relating to COVID-19 drive-through clinics and configuring system related changes. Extra laboratory equipment was commissioned to facilitate COVID-19 testing.

Further, OACIS development staff working on electronic ordering to EPLIS and foreign EMR results viewing were also redirected to implement urgent COVID-19 system changes.

## 2.5 Project budget and expenditure

---

The EPLIS Program was originally budgeted at \$29.6 million. This was subsequently revised up to \$34.5 million. The EPLIS Program closed out in April 2018 after rollout to all in-scope sites at a total cost of \$33.9 million.

The Optimisation Project was budgeted at an additional \$5 million. This included a major system upgrade to enable workflow improvements. The project finished around \$758 000 under budget.

The separate Billing Remediation project cost \$160 000 to complete, while another \$770 000 has been allocated to replace the interface for electronic pathology ordering and results messaging to external general practitioners.

At the time of our review, SA Health was updating the benefits realisation associated with the EPLIS Program and the Optimisation Project.

## 3 Electronic Medical Record Project

### 3.1 Executive summary

---

#### 3.1.1 Introduction

Since 2012 SA Health has been implementing its EMR system, previously known as the Enterprise Patient Administration System (EPAS).

Implementing EMR across the health network is the key to SA Health achieving a single Statewide electronic health record for each patient. Other implementation drivers include supporting several State policy and strategic agendas and also addressing inherent risks associated with maintaining legacy patient administration and billing systems.

Given the importance and costs associated with the EMR Project we have regularly updated Parliament on its implementation status, including highlighting the various challenges.<sup>5</sup> These have included implementation delays, increased costs and functionality challenges.

In 2019-20 we again sought an implementation status update, which we summarise in this section.

#### 3.1.2 What we found

Our review noted that since our last status update, SA Health has made several system enhancements to EMR and has completed its implementation at two exemplar sites (the MGDHS and the RAH). This includes making improvements to the EMR user interface, changing process workflows and integrating with the Commonwealth Government's My Health Record (MHR) system.<sup>6</sup>

Since May 2020 the SA Government has approved an additional \$204.4 million for the EMR Project to complete the rollout to the remaining in-scope metropolitan sites through to June 2023.

Our review noted the following challenges for the project:

- tracking all project benefits
- updating the budget estimate to complete the project
- getting user feedback
- addressing priority system configuration and development issues
- implementing a future billing solution
- resolving system configuration and defects
- replacing the current mobile device solution
- improving medical record scanning
- maintaining sufficient project resourcing
- Flinders Medical Centre (FMC) implementation complexities.

---

<sup>5</sup> Auditor-General's Report 9 of 2019 *Information and communications technology reviews, October 2019*.

<sup>6</sup> For more information on MHR refer to <<https://www.myhealthrecord.gov.au/>>, viewed 9 November 2020.

## 3.2 Review objective, scope and approach

---

The purpose of our review was to obtain an update from SA Health on the EMR Project's current implementation status, including the outcomes from the implementation at the exemplar sites. We also sought an update on the budget and expenditure to date, expected benefits and key challenges impacting the EMR Project.

As this was a high level review, we relied on the information provided by SA Health and did not seek supporting evidence to validate these responses. We did not perform detailed control testing, evaluate system usability or review any processes specific to the COVID-19 outbreak.

## 3.3 EMR Project background

---

EMR is currently implemented at the following sites:

- Noarlunga Hospital and Noarlunga GP Plus Super Clinic (August 2013)
- Aldinga GP Plus Health Care Centre (November 2013)<sup>7</sup>
- SA Ambulance Service Inc. metropolitan headquarters (November 2013)
- Port Augusta Hospital (December 2013)
- The Queen Elizabeth Hospital (June 2016)
- Marion GP Plus (April 2017)
- Royal Adelaide Hospital (initial implementation in September 2017 and completed in March 2020)
- Flinders Medical Centre (former Repatriation General Hospital services at the new building) (October 2017)<sup>8</sup>
- Hampstead Rehabilitation Centre (March 2018)
- Mount Gambier and Districts Health Service (MGDHS) (October 2019)
- Sefton Park Primary Health Care Services (May 2020)<sup>9</sup>.

The initial implementation at the RAH was completed in September 2017, and was limited to patient administration and minimal clinical functionality in the emergency department.

---

<sup>7</sup> EMR was also implemented at the Morphett Vale and Seaford GP Plus Health Care Centres but they have since closed.

<sup>8</sup> EMR was implemented at Daw House in December 2103 and the Repatriation General Hospital in April 2014. These services have moved to the FMC new building.

<sup>9</sup> Sefton Park was not an original in-scope site. SA Health advised this site was activated as a matter of priority as part of the Central Adelaide Local Health Network Incorporated's (CALHN's) strategy to ensure integration with acute sites. SA Health advised this implementation reduced clinical and patient safety risks within CALHN and supported unknown impacts of COVID-19.



Additional implementation to this site was split into four stages:

- Stages 1-3 were implemented in the second half of 2019. This included documents and flowsheets for inpatient and outpatient for the remaining business units, as well as hospital discharge medication ordering.
- Stage 4 was implemented in mid-March 2020. This included implementing the remaining clinical functionalities, such as medication management and ordering, clinical orders and worklist manager for inpatient, outpatient and the emergency department and discharge summaries. The outcomes of this implementation are discussed in section 3.4.

### 3.4 Implementation outcomes at two exemplar sites

---

One of the key recommendations from a December 2018 independent review was to optimise the EMR solution and to make major functionality changes at the two exemplar sites (MGDHS and the RAH). It was recommended that future decisions about the project, such as the implementation approach for future sites, should be contingent on user acceptance at these two sites.

Other recommendations from this review included passing responsibility for implementing and configuring the system to LHNs and clinicians, improving post go-live support and replacing the billing module as a priority.

We were advised that SA Health did not intend to implement all recommended changes from the December 2018 independent review as part of the two exemplar site implementations, as they could not all be funded and delivered in 2019.

Key changes that SA Health advised us that it did implement included:

- improving the EMR program governance
- a major product upgrade (version 14.3 to version 17.3)
- increasing LHN accountability
- implementing a phased activation approach
- increased onsite engagement
- an updated training approach and training facilities
- workflow standardisation and establishing new Clinical Specialty Groups
- establishing the Office of the Chief Medical Information Officer (OCMIO)
- clinicians being responsible for the system configuration at the two exemplar sites, overseen by the LHNs.

Implementation at the MGDHS was completed in October 2019 and stage four at the RAH was completed in mid-March 2020. At the completion of the exemplar sites, SA Health intended to decide whether to continue to implement the revised solution at the remaining in-scope sites or consider other options.

The EMR Project advised us that MGDHS staff have adapted well to using EMR, as have RAH staff using the additional clinical functionalities. At the time of this Report, there were no reported significant issues. Meeting end user expectations is further discussed in section 3.10.

### 3.5 Project budget and expenditure

The approved budget for the EMR Project (then known as the EPAS Program) was originally \$408 million. This was revised up in 2011-12<sup>10</sup> to \$421 million, and in September 2017 the EMR Project advised that it would cost \$471.1 million to complete the rollout to all in-scope sites. The December 2018 independent review subsequently estimated the cost to be \$695 million.

In its response to the independent review, the SA Government announced that it would improve the EMR implementation approach and focus on implementations at the two exemplar sites in 2019. The SA Government also announced that this would be completed within the existing EMR Project budget allocation and would enable the completion of a business case to examine future stages.

Following the completion of the exemplar sites, SA Health submitted a business case and budget proposal for consideration as part of the 2020-21 State Budget process. While this proposal was being considered, the existing EMR Project funding was exhausted in early June 2020. A funding allocation of \$7.6 million in 2019-20 was therefore provided by the Department of Treasury and Finance to ensure continuity of the EMR Project team while the 2020-21 budget proposal was considered.

In the 2020-21 State Budget tabled on 10 November 2020, the SA Government announced additional funding of \$196.8 million over three years to complete the rollout of EMR into the remaining in-scope metropolitan sites. This brings the total approved budget to \$626.8 million. We have not sought details of the approved additional funding.

At the time of our review, SA Health was developing a detailed budget estimate to complete the rollout, provide operational support and conduct optimisation (improvement) activities (this is further discussed in section 3.10).

**Figure 3.1: Project budget and expenditure as at October 2020<sup>11</sup>**

	Original approved budget (December 2011) \$000	Revised approved budget (2011-12 mid-year budget review) \$000	Revised approved budget (2020-21 budget position) \$000	Expenditure to date (end of October 2020) \$000	Remaining budget \$000
Capital and operating expenditure	363 100	372 292	576 682	443 195	133 487
Contingency	44 800	49 162	49 162	1 933	47 229
Total budget	407 900	421 454	625 844 <sup>12</sup>	445 128	180 716

<sup>10</sup> SA Health attributed the increase to an accounting error in which inflationary indexation was omitted from the original budget.

<sup>11</sup> These figures were provided by SA Health and are unaudited.

<sup>12</sup> An additional \$1 million contingency, not included in this figure, was allocated to the EMR Project from within SA Health's existing budget.

Separate from the EMR Project budget, SA Health is also developing a business case to replace the legacy Country Health patient administration system, Chiron. It has not yet fully estimated the cost to complete this implementation or requested any additional funding from the SA Government to support the business case. Country Health includes over 60 sites and over 40 aged care facilities.

## 3.6 EMR key process improvements

---

The SA Health Clinical Advisory Council (CAC) advised us that a new clinical ownership model recommended by the December 2018 independent review has provided clinicians with a vehicle to express their views on EMR system workflows.

The EMR Project further advised us that several workflow improvements have been made since involving dedicated speciality groups. This process has included 80 clinicians representing over 30 specialty areas. We were advised that 91 system enhancements were delivered through the CAC between September 2019 and May 2020.

Key changes include:

- improvements to the user interface and experience by streamlining the document entry process
- piloting smartcard tap on/tap off functionality at TQEH, intended to create access efficiencies and portability between devices for clinicians<sup>13</sup>
- trialling an inpatient status board and discharge document at four wards at the RAH to provide better visibility of a patient's discharge status and improve discharge planning
- integrating EMR with MHR to allow greater visibility of a patient's MHR information (for patients who have not opted out of MHR).

## 3.7 Future implementation plans

---

In January 2020, the EMR Project commenced planning for activations primarily at the FMC and the WCH.<sup>14</sup>

The EMR Project intended to commence its implementation at the FMC in November 2020, however it was advised by the Southern Adelaide Local Health Network Incorporated (SALHN) that several operational imperatives were at risk if the activation went ahead. Given the FMC provides several services that are similar to the WCH, the EMR Project intends to closely align these hospital activations. As such, the EMR Project approved SALHN's recommendation to reschedule the first activation stage at the FMC until March 2021.

---

<sup>13</sup> The original EPAS business case envisaged the new RAH would be reliant on smart card technology on its opening and the EMR Project would facilitate its use when required.

<sup>14</sup> These activations also include additional services within SALHN and the Women's and Children's Health Network Incorporated.

In August 2020, the EMR Project Board approved a three-year rollout plan for the remaining in-scope sites, through to June 2023. It is intended that each site will be rolled out in a staged approach and completed by the following dates:

- FMC (May 2021)
- WCH (December 2021)
- Modbury Hospital and Super Clinic and Gilles Plans GP Plus (October 2022)
- Lyell McEwin Hospital and Elizabeth GP Plus (December 2022)
- Glenside Campus (Mental Health Services) (June 2023).

During this three-year period, the EMR Project also intends to continue to optimise and enhance the system and provide operational support. The implementation schedule went through several layers of consultation and governance within SA Health, including the LHNs and the OCMIO.

## 3.8 Update on current project activities

---

### Key project activities

At the time of this Report, the EMR Project was transitioning EMR staff from CALHN to SALHN for implementation at the FMC. We were advised that the EMR Project has sought to accelerate this implementation by deploying all available resources and improve its service delivery, transparency and the use of EMR.

The EMR Project has now completed site discovery activities<sup>15</sup> at the FMC and is working on site configuration and activation planning. The FMC presents certain challenges to the EMR Project, which are further discussed in section 3.10. It is intended that EMR will also be made available at the Flinders Private Hospital where FMC patients receive clinical care or patient administration activities are conducted.

The EMR Project is also conducting discovery activities at the WCH and developing a schedule for future site delivery.

System optimisation activities are continuing. They involve standardising workflows, deploying clinical and patient administration system enhancements, and system changes to support a response to COVID-19.

Resourcing required to deliver all priority work continues to present a challenge to the project. Current project challenges are further discussed in section 3.10.

### Other ongoing activities

The EMR Project advised us that several enhancements were made across disciplines. It is currently finalising several surgical process improvements such as changes to operation documentation, patient order sets<sup>16</sup> and surgical safety processes.

---

<sup>15</sup> Discovery activities included identifying all site requirements.

<sup>16</sup> Patient orders can include medication, nursing care plans and other patient treatments.

The EMR Project and CAC are also delivering improvements to the emergency department, intensive care unit, medical emergency response unit, general nursing and patient administration and billing areas.

Other optimisation activities planned include developing a new inpatient status board and inter-hospital transfer report to improve the handover of care.

The EMR Project is in the planning stage of integrating with other supporting systems, including:

- a new Thoracic Medicine HealthTrack system for the RAH and TQEH. It would exchange patient information, alerts, documents and test results with EMR
- the Anaesthesia Information Management Systems to transfer patient demographic information including dates of birth, addresses and other visit details
- the Community Based Information System to allow visibility of clinical documents about a patient's mental health in EMR
- Secure Messaging Delivery to deliver electronic documents and results to external health care providers.

The EMR Project obtained independent assurance for its exemplar site activations at the MGDHS and the RAH. We were advised that independent advice will also be obtained for activations at the FMC and WCH. The objective of these reviews is to provide assurance over site readiness and decision assessments for the activation approach. The project's risk and issue management will also be assessed and a post-implementation review will be conducted.

## 3.9 COVID-19 impacts

---

In responding to the COVID-19 pandemic, the EMR Project advised us that it was challenging to develop and implement a work from home approach for its staff while still ensuring that project deliverables were being met.

To help address this challenge an EMR response team was formed, with daily meetings occurring. Clinical Specialty Groups<sup>17</sup> were also consolidated into a CAC emergency response group. The Clinical Specialty Groups were then realigned to manage other critical EMR activities.

The emergency response group was required to respond rapidly to enhancements and optimisation change requests. These included COVID-19 requirements such as new administrative and clinical workflows and catalogue changes related to pathology, clinical codes and billing. The EMR Project was also required to make system configuration changes

---

<sup>17</sup> SA Health made changes to the EMR Project's governance arrangements following the independent review. It implemented several Clinical Specialty Groups to focus on standardising workflows and the system configuration in their clinical area. They reported to a CAC.

for new and existing outpatient clinics to support COVID-19, including providing telehealth services.<sup>18</sup> These changes were needed to treat and move patients safely during the outbreak.

The EMR Project also responded to several requests from LHNs for assistance. Additional EMR workforce training was also required as the SA Government responded to the pandemic.

## 3.10 Current program challenges

---

### Tracking all project benefits

The last time the EMR Project updated the expected tangible benefits of the project was in June 2017. At that time SA Health advised that it had achieved \$183.2 million of the \$435.6 million originally anticipated cost benefits and offsets (over a 10-year period).

These tangible benefits included removing several legacy systems across SA Health and reductions in patient length of stay and hospital acquired complications in EMR activated sites.

SA Health advised us that the OCMIO continues to monitor the EMR Project's clinical benefits and patient outcomes. Although the LHNs are accountable for realising and measuring the EMR clinical benefits, the OCMIO is also in the process of developing a live dashboard to record and track benefit measures across SA Health EMR sites.

Despite this activity we were advised that neither the EMR Project or the OCMIO are currently monitoring the financial benefits associated with implementing EMR. Therefore, at the time of our review, we could not determine whether the cost benefits and offsets identified in the original EPAS business case would be achieved.

### Updating the budget estimate to complete the project

Having received funding in the 2020-21 State Budget, SA Health is now developing a detailed budget estimate and considering funding alternatives to complete the remaining project activities. This includes the scope, timing and resource allocation.

Whether there will be further budget submissions will be known when this work is complete.

### Getting user feedback

In our October 2019 Report we raised concerns about the extent of user consultation that occurred before continuing with the rollout to all in-scope sites. This included users being provided with enough time to use and accept the system in their hospital environment.

---

<sup>18</sup> Allows clinicians to provide health services to patients remotely via video technology.

In response, the EMR Project advised us that it had a strong focus on getting user acceptance at the exemplar sites before rolling out EMR to other in-scope sites.

To help understand user acceptance and challenges, the EMR Project conducted an end user satisfaction survey, which was completed in December 2019.

Despite these positive actions, we noted that the survey only had a 6% response rate (761 responses from 16 000 activated site users). In addition, at the time of the survey, EMR had only been implemented at the MGDHS for two months and stage 4 of the RAH implementation was in progress (completed in March 2020). Despite this, the EMR Project commenced planning activities for the FMC in January 2020.

The EMR Project acknowledged that the timing of the survey was too early to fully gauge the clinical user experience at the RAH after improvements were made to EMR, including the implementation approach. Despite this, it advised us that the survey results will be used as a baseline for future surveys.

We were advised by the EMR Project that an additional survey is planned for early 2021 to capture user experience after the full clinical activation of EMR at the RAH.

### Addressing priority system configuration and development issues

The intention of the exemplar site implementations was to trial a revised solution and get user acceptance of its improved configuration and functionalities. Future program decisions were to be based on the outcomes of these implementations.

The December 2018 independent review<sup>19</sup> noted that continuing with the system 'as is' was not acceptable and raised several priority configurations for development, which the SA Government accepted in principle.

However, due to funding and time constraints, SA Health advised us that it did not intend to implement all recommended changes as part of the exemplar site implementations. SA Health stated that implementing all the recommendations would likely delay the implementations until at least the end of 2020 and require significant budget allocation. It also preferred to deploy the remaining clinical functionalities at the RAH.

At the time of this Report, SA Health advised us that it had addressed 53% of the total recommendations, 30% were in progress and on target for completion, while a further 17% were delayed. Figure 3.2 summarises which priority configurations were implemented as part of the exemplar sites.

---

<sup>19</sup> *EPAS Independent Review: Final Report*, December 2018, <[www.sahealth.sa.gov.au](http://www.sahealth.sa.gov.au)>, viewed 15 October 2019.

**Figure 3.2: Summary of independent review priority configurations expected for implementation at exemplar sites**

Configuration for development	Fully implemented by SA Health at the exemplar sites (prior to decision to continue with the rollout)
Upgrade EMR to version 17.3	Yes
User interface optimisation, including the presentation of information, standardising workflows, simplifying patient order sets and personalising specialty templates.	Partially (system optimisation through specialty groups continues)
Pharmacy integration	No (business case not supported by Digital Health Board)
Meeting the patient record requirements of the SA Coroner, SA Crown Solicitor, SA Police, Courts, freedom of information requests and other statutory bodies	No (some legislative and policy requirements are being finalised)
Implementing the mobile device functionality	No (will assess functionality as part of further product upgrade in 2021)
Clinical reporting and analytics capability	No (capabilities are being progressed with input from the OCMIO)
Replacement of the record scanning solution	No (upgrade underway with activation planned for first quarter of 2021)
Replacement of the billing module	No (SFM to be used in the short-term; longer-term replacement identified. This is discussed further below)
Configuring important functionalities, such as paediatrics and obstetrics	No (in progress for FMC and WCH activations)
Integration with Community Based Information Systems for mental health	No (business case is currently being developed)

### Implementing a future billing solution

SA Health uses EMR's Sunrise Financial Management (SFM) module to process patient billing. Patient billing has been problematic for some time, which was highlighted in the December 2018 independent review.



SA Health advised us that although the issues identified in the independent review have essentially been resolved through optimisation activities, it intends to use the PBRC system as the longer-term strategic approach. The PBRC is currently used by SA Pathology for patient billing.

We noted that there is currently no indicative time frame for when PBRC is expected to replace SFM for EMR billing. SA Health advised us that SFM will continue to be used until a move to PBRC is justified by proven benefits.

## Resolving system configuration and defects

The EMR Project is still receiving a steady flow of system change requests. These changes may arise from clinical practices changes, identified workflow issues, user requests for improvement or identified system defects. They also include changes related to the ordering catalogue,<sup>20</sup> performance optimisations and COVID-19.

The EMR Project advised us that it implemented functionality upgrades in March 2020 and June 2020, with a further upgrade planned in November 2020. It also intends to implement a patient flow upgrade in February 2021, which will include:

- an updated user interface and improved patient bed management
- fixes for several issues reported by SA Health
- support for mobile device operating systems (Android and iOS)
- removing the need for other dependent software.

Following the December 2018 independent review, SA Health adopted a revised implementation approach where system configuration changes are clinically led by end users. Dedicated resources were assigned to several specialty groups to prioritise and develop functional specifications to address business problems. These groups were also responsible for delivering many outstanding change requests that were consolidated and delivered to all sites.

These dedicated group activities are expected to continue until early 2022 and will inform the prioritisation of project resources.

The CAC advised us that users have become more competent in using EMR. To improve workflows between disciplines their requests for system changes have become more complex and challenging.

An update on the status of system defects is summarised in figure 3.3. As of September 2020, there were 288 outstanding production defects. 142 of these are priority two defects. None are priority one.<sup>21</sup>

---

<sup>20</sup> Used to order patient treatments and prescriptions.

<sup>21</sup> Priority one defects are defined as having a severe impact on the business and, by definition, result in an immediate and sustained effort by all available EMR Project resources until resolved.

**Figure 3.3: Summary of all EMR system defects from October 2019 to September 2020**

Month - Year	New defects	Resolved defects	End of month total defects
October 2019	45	33	298
November 2019	28	33	293
December 2019	19	22	290
January 2020	30	25	295
February 2020	18	24	289
March 2020	24	30	283
April 2020	36	27	292
May 2020	26	29	289
June 2020	23	21	291
July 2020	21	29	283
August 2020	20	28	275
September 2020	25	12	288

## Replacing the current mobile device solution

Implementing a suitable mobile device solution with the required user functionality has been a challenge for the EMR Project for some time.

Sunrise Mobile MD II is available for EMR users. This mobile device solution is designed for medical staff but has reduced functionality. Despite this, users can review current active orders, place, discontinue and cancel orders, note some documentation, view and send new severe health messages, and view and trend results.

Another solution called Sunrise Mobile Care was piloted in 2015. It was expected to provide more focused functionality for nurses and clinicians. However, the pilot was rejected as issues were identified with key clinical user functional requirements and it was not progressed.

The EMR Project advised us that the latest mobility solution will be available in the next product upgrade. This update is planned for the first half of 2021. The delivery of mobility functionality will, however, depend on a detailed assessment by SA Health.

Given ongoing usability challenges with the 'Workstations on Wheels' and bedside monitors, users continue to operate without a suitable mobile solution. It is important that the EMR Project carefully considers its users and the suitability of any option by conducting extensive user acceptance testing before deploying it.

## Improving medical record scanning

We were advised by the EMR Project that while EMR has reduced the extent of paper medical records, some paper records are still maintained, such as temporary patient files, consent forms, advanced care directives and referrals.

In our November 2016 Report,<sup>22</sup> we raised concerns that Sunrise Records Management used for document scanning in EPAS introduced process inefficiencies. We noted that several different document types were scanned into EPAS in a non-searchable format.

In response, SA Health advised us that it was monitoring the performance of the scanning functionality. SA Health had implemented functionality to categorise scanned documents, and further enhancements were in progress.

In our October 2019 Report, we noted that the EMR Project was planning to replace Sunrise Records Management with another Allscripts product called BOSSnet. The EMR Project advised us that Sunrise Records Management was at the end of its life, was incompatible with the Windows 10 operating system and had issues with indexing scanned documents.

In our current review, the EMR Project advised us that testing of the new BOSSnet solution identified several defects that needed to be addressed before continuing with a staged implementation approach. Testing also identified that most of the current scanners will need to be replaced as they are not compatible with BOSSnet.

Before original paper medical records can be destroyed, EMR needs to be considered a compliant business system by State Records of South Australia. To do this, certain metadata needs to be attached to scanned documents. While the EMR Project expects that BOSSnet will improve the ability to capture data about scanned documents, it will need to conduct a further analysis and consult with State Records once it is implemented.

Despite these challenges, the EMR Project intends to implement BOSSnet at the MGDHS and the RAH in February 2021.

## Maintaining sufficient project resourcing

Resourcing continues to be a challenge for the EMR Project to ensure all priority work is delivered within required time frames.

In early 2020 the EMR Project began reporting the loss of key project staff due to short-term contracts as a key risk to the EMR Project Board. In addition, the EMR Project could not fill vacant project positions until funding was approved beyond June 2020.

At the time of this Report, we were advised by SA Health that funding for resources had been secured and that the EMR Project was actively recruiting the resources needed to support the approved program of work. Some key positions had been filled.

We noted that optimisation activities are currently competing for the same resources as site activations. As such, resourcing presents an ongoing risk to implementing all independent review recommendations. Activated sites also require appropriate resources to understand how to use the system to meet their requirements.

---

<sup>22</sup> Auditor-General's Supplementary Report for the year ended 30 June 2016 *Health information technology systems: November 2016*.

The EMR Project and LHNs should continue to diligently manage their resourcing risks, particularly with the continued uncertainty of the COVID-19 pandemic. Project resource availability and capacity should be clearly understood. The EMR Project should also consider its resourcing risks when scheduling future site activations by adding some contingency.

### Flinders Medical Centre implementation complexities

In January 2020, the program commenced planning activities to activate EMR at the FMC. These planning activities were paused in April 2020 as funding for the EMR Project past June 2020 was not approved.

Once the SA Government approved the EMR Project's additional funding, all available resources were deployed to accelerate the implementation of EMR at the FMC. The EMR Project has also sought to improve its service delivery, transparency and the use of EMR.

Activation at the FMC presents certain challenges. For example, the FMC is implementing services that are not provided at any of the other EMR activated sites, such as maternity, neonatal and paediatrics. There is a significant amount of system configuration work required to implement these functionalities. At the same time, the EMR Project has started activation planning at the WCH, which also provides these services.

SA Health advised us that SALHN is also in the process of making changes to its workforce as part of its Southern Health Expansion Plan. This involves significant service location moves, potentially reducing the availability of some SALHN resources for EMR activation activities, including training and workflows.

The EMR Project and SALHN advised all FMC staff in September 2020 that an EMR activation would commence in November 2020. This was then delayed until March 2021 because several operational imperatives were at risk if the activation continued.

Given the EMR Project's ongoing resourcing challenges to meet all priority optimisation works and the site complexities at the FMC and WCH, it should ensure that activation plans are realistic and supported by the LHNs.

## Appendix – Glossary of abbreviations and terms

<b>Term</b>	<b>Description</b>
CAC	SA Health Clinical Advisory Council
CALHN	Central Adelaide Local Health Network Incorporated
EMR	Electronic Medical Record
EPLIS	Enterprise Pathology Laboratory Information System
FMC	Flinders Medical Centre
LHN	Local health network
MGDHS	Mount Gambier and Districts Health Service
OACIS	Open Architecture Clinical Information System
OCMIO	Office of the Chief Medical Information Officer
PBRC	Power Billing and Revenue Collection
RAH	Royal Adelaide Hospital
SALHN	Southern Adelaide Local Health Network Incorporated
SFM	Sunrise Financial Management
TQEH	The Queen Elizabeth Hospital