Private & Confidential
Date: 17 October 2014

Health Service Investigation

Final Report

Investigation into reporting of radiology services at the Gold Coast Hospital and Health Service

Health Service Investigation – Final Report

Executive summary

1. Background

(a) The health service investigators were appointed by the Director-General, Department of Health to:

(i) Assess the low reporting of radiology at Gold Coast Hospital and Health Service (**Part A of the investigation**); and

(ii) Assess if there are any other Hospital and Health Services that are not achieving a clinically acceptable reporting rate for radiology, and if so, understand why and identify strategies to enable achievement of a clinically acceptable level (**Part B of the investigation**); and

(iii) Assess the governance of Health Support Queensland for the identification, escalation and management of Hospital and Health Services reporting of radiology and identify effective arrangements which can be implemented statewide to ensure reporting levels are sustained at a clinically acceptable level (**Part C of the investigation**).

(b) The investigators have been asked to make findings and recommendations in relation to these matters.

2. Introduction

2.1 Radiology reporting in context

(a) There can be no question that diagnostic imaging has revolutionised the provision of health care. Its ability to help make appropriate diagnosis, guide focussed treatment and avoid unnecessary exploratory procedures is extraordinary. Interventional radiology has replaced many invasive surgical techniques and will continue to grow and expand with less cost and morbidity.

(b) In order for diagnostic imaging to improve care and reduce cost it is essential that:

(i) the imaging request is evidence-based (requires decision support system);

(ii) the relevant clinical information is available (including prior imaging);

(iii) the right image is performed and correctly acquired;

(iv) the examination is reported in a clinically relevant timeframe;

(v) the image and report can be shared.

(c) A formal report by a specialist radiologist can assist the doctor caring for a patient to identify true disease as well as to find incidental pathology.

(d) A delay in reporting x-rays can put patients at risk, especially those attending emergency departments who frequently have emergent diagnosis. Accurate reporting of x-trays also avoids inappropriate treatment.

(e) Diagnostic imaging departments are crucial to the functioning of modern hospitals, and many national standards including the National Emergency Access Target (**NEAT**) are predicated [1]on a highly functional imaging department.

2.2 Defining a clinically acceptable radiology reporting rate

(a) In order to respond meaningfully to the questions raised by the terms of reference, a critical threshold issue to establish is what is a clinically acceptable radiology reporting rate. An assessment of rate needs to account for the patient's clinical status, the type of image being performed and the expected time frame for the result to be available.

(b) The expectation of the community and clinicians is that all diagnostic imaging procedures require a report, by a radiologist, in a timely manner, with the timeframe dictated by the patient's condition and setting. Emergency department patients need to have images reported within an hour to meet NEAT requirements, while those presenting for follow up in a cancer clinic would need the images reported within 24 hours.

(c) There is no requirement for a specialist radiologist report where the imaging is performed during a procedure, for the purposes of intraoperative guidance, provided the clinician performing the procedure records the results of the imaging as part of the operative note.[2] There may also be circumstances where the clinical circumstances may warrant the clinician to request a report.[3] All post-operative imaging requires a formal radiologist report.

(d) By way of practical guidance about acceptable radiology reporting rates, the Australian mean reporting rate is 13,600 reports per FTE per annum. The Royal Australian and New Zealand College of Radiologists (RANZCR) suggests a rate of 10,000 reports per FTE per annum.

(e) Dr Herkes and Dr Sprague consider that for the purposes of adopting a benchmark for the purposes of this report, at least 90% of films should have formal specialist radiology reports and that 80% of these should be completed within 24 hours. For many Diagnostic Imaging Departments sub-specialty demands including meeting the timeframes recommended by NEAT may necessitate many of these studies being reported in an even more timely manner.[4]

(f) Dr Herkes and Dr Sprague have adopted these figures on the assumption that around 10% of imaging will be taken intraoperatively (and thus will not require a formal report) and around 20% of imaging may be non-urgent and not possible to report on within 24 hours (for example images taken in regional or remote facilities on weekends).

(g) Dr Herkes and Dr Sprague wish to reiterate their expectation for a tertiary facility is that diagnostic images which require formal reporting should be reported within the time frames appropriate to the clinical situation (paragraph (b) above) in 100% of cases.

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[1] Diagnostic Imaging Strategy 2013 - 207 QCS Recommendations 2011

[2] For example, imaging during surgical plating of a fracture required to ensure correct screw placement.

[3] For example, a formal report may be required to be made during an ERCP and cholangiography as a part of a cholecystectomy procedure.

[4] Dr Herkes and Dr Sprague have recommended the implementation of a Relative Value Unit scheme as a more accurate and suitable method of establishing individual key performance indicators and for monitoring and auditing the performance of a diagnostic imaging department generally. Refer to the recommendation in section 13.8 below.

3. Part A – Assessment of low radiology reporting rate at GCHHS

3.1 Part A Findings

(a) In relation to GCHHS radiology reporting policy and procedure, Dr Herkes and Dr Sprague have formed the view that:

(i) The GCHHS has inadequate policies, procedures or guidelines to appropriately manage its Diagnostic Imaging Department. Policies and guidelines which exist at a state and national level have not been implemented at GCHHS.

(ii) The 2012 protocol to improve the radiology reporting rates for patients undergoing diagnostic imaging in the emergency department, intensive care unit and during ward admission was not effective.

(b) In relation to GCHHS radiology review reporting practices, and the potential reasons for the ongoing lower than clinically acceptable radiology rates, Dr Herkes and Dr Sprague formed the view that:

(i) There were significant numbers of patients whose radiology plain x-ray films were unreported which exposed patients of GCHHS to increased clinical risk in relation to timely diagnosis and treatment.

(ii) While the diagnostic imaging reporting rate has fluctuated, it has generally been lower than clinically acceptable and deteriorated further following the transition from the Gold Coast Hospital to the Gold Coast University Hospital and the new Diagnostic Imaging Department.

(iii) Despite having been recognised by clinical governance at both state and hospital levels, and despite significant extra resources, radiology reporting rates at GCHHS remained unsatisfactory until quite recently (discussed under the next heading).

(iv) There was a lack of leadership and accountability for developing overarching prescribed workflow processes and procedures including:

(A) a lack of key performance indicators for individual staff and the Diagnostic Imaging Department as a whole including an expectation that radiology staff should not leave work until the day's reports are completed;

(B) a lack of management data about the work performed on each piece of equipment. As far as could be ascertained, equipment usage is not recorded, monitored or reviewed;

(C) an outdated paper-based system of managing diagnostic imaging requests and tracking patient appointments, prioritisation and follow up.

(v) The existing RIS/PACS system is too slow for the purposes of a busy tertiary centre with the RIS interface speed impacting on efficient reporting practices.

(vi) The purchase of scanning equipment from multiple vendors is likely to increase the training burden on radiology staff as well as maintenance costs.

(vii) Three previous external reviews have, at some cost and effort, examined the issues surrounding the low radiology reporting rates, but have not led to any effective or satisfactory improvement to the culture, governance and workflow processes for radiology reporting rates at GCHHS on a sustained basis.

(c) In relation to the remedial actions by GCHHS to address low reporting rates, Dr Herkes and Dr Sprague formed the view that:

(i) The retrospective review, improved reporting rates and improved governance measures are appropriate and if sustained will serve the patients of the GCHHS well.

(d) In relation to whether these steps are adequate to achieve and sustain clinically acceptable rates, Dr Herkes and Dr Sprague formed the view that:

(i) In-house radiology reporting should be encouraged and facilitated to the greatest extent possible. The ability for on site radiologists to form an ongoing relationship with other hospital clinicians greatly enhances the functioning of the hospital. This relationship includes education of hospital clinicians, shared case meetings, request triage and notification of abnormal results.

(ii) Wherever possible the disadvantages of outsourcing radiology reporting should be avoided.

(iii) The recent interest from the GCHHS Board and its Safety, Quality and Clinical Engagement Committee is appropriate and should continue. The Board and its Safety, Quality and Clinical Engagement Committee needs to be provided with ongoing reports of the progress of the backlog, and should take a primary role in ensuring that there is no recurrence of underreporting.

(e) In relation to whether the proposed actions of the Medical Imaging Reform Project are adequate to address the backlog and ensure that GCHHS sustains a clinically acceptable reporting level, Dr Herkes and Dr Sprague formed the view that:

(i) continued monitoring such as is evident in the period from July needs to be reported to the Director of the Diagnostic Imaging Department and the GCHHS CE to ensure that the backlog is cleared. Special attention needs to be paid to the clinical triage of abnormal results to feedback to the patients and their general practitioner;

(ii) weekly reports detailing the reporting rate by modality need to be provided in an ongoing manner;

(iii) the current management initiatives if sustained should ensure that the underreporting of images does not recur.

3.2 Part A Recommendations

(a) In relation to GCHHS review and reporting practices, Dr Herkes and Dr Sprague recommend that:

(i) a workflow review should be undertaken to ensure that processes which can be undertaken by staff in other areas of the hospital, are performed in those other areas such as, for example, cannulation;

(ii) tasks should be assigned to staff of an appropriate level, with specific training to undertake the task, to avoid the issues arising from incomplete request forms being handled outside the clerical system by clinicians (for example, clinicians having to chase up the patient's creatinine level, a measure of a renal function);

(iii) GCHHS to develop and implement policies to achieve radiologist reporting on 100% of diagnostic imaging studies that require a formal report within the time frame appropriate to the clinical situation (as outlined in paragraph 2.2);

(iv) GCHHS to investigate and implement a modern order entry system with appropriate decision support and appropriate management reports to allow the

Diagnostic Imaging Department to optimise the care of patients. The order entry system must allow a patient to be tracked and prioritised, to optimise that care.

(A) The recommendations to Health Support Queensland in the Sg2 Report and the subsequent Diagnostic Imaging Strategy 2013-2017 are sound and would significantly improve diagnostic imaging within GCHHS and across the State;

(B) The GCHHS Board should consider sponsoring this report at a state level and champion its implementation, as a leading HHS within Queensland.

(v) GCHHS to develop business reports on a weekly basis and communicate this information to the Diagnostic Imaging Department. KPIs need to be developed to include both patient flow and staff data. Waiting lists, no-show rates, reporting turn-around times and machine utilisation should be combined with staff performance for all levels of staff within the Diagnostic Imaging Department.

(vi) Radiology reporting should include peer comparison provided by Health Support Queensland and should include modality reports (for example in each case of CT, MRI, ultrasound, plain film).

(vii) GCHHS to develop a Relative Value Unit system for diagnostic imaging reporting. The RANZCR is progressing recommendations for a National relative value unit (RVU) based work load benchmark and it would be prudent to adopt this when finalised.[5]

(viii) Department of Health and/or GCHHS to develop an information technology solution to overcome the inadequate RIS/PACS system currently in use at GCHHS. Dr Herkes and Dr Sprague recommend this could be achieved either by:

(A) Department of Health identify and engage system and infrastructure supplier for adoption at all HHSs; [6]

(B) GCHHS, which has allocated funds for such a system, to act as sponsor for a new system and infrastructure supplier with other key HHSs to test, support and implement the system on a progressive basis.[7]

(ix) GCHHS to demonstrate overwhelming clinical imperative when deciding to purchase equipment from alternative vendors to minimise the risks of user error and to ensure training and maintenance requirements are streamlined.

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[5] Criterion 2.2.6; RANZCR Accreditation Standards for Education Training and Supervision of radiology trainees 2012. www.ranzcr.edu.au.

[6] Dr Herkes and Dr Sprague understand that the information technology system currently in use at the GCHHS is not current and that upgrades have not been implemented for some time. Representatives from the Department of Health have advised that a CERNER operating system is planned for implementation in March 2015 and will be made available to GCHHS.

[7] This option was recommended in the Sg2 external review report, however, despite carefully considering the views expressed by the GCHHS about its intention to procure its own RIS/PACS system, Dr Herkes and Dr Sprague have some reservations about the capacity of the GCHHS to support a new system and infrastructure on its own. They acknowledge the advanced nature of the GCHHS's procurement project and that, not only will it have improved reporting capacity, but will also include a work flow system (referral, appointment scheduling, waiting lists, prioritising, reporting, patient follow up etc) that is not available currently within the RIS system. Dr Herkes and Dr Sprague consider that if GCHHS does procure its own technology system, there must be a robust system of data integrity, reporting, management and accountability with rigorous system oversight. Data produced from any GCHHS developed system must be able to be produced in a way that continues to inform the overall State amalgamated picture of radiology reporting.

(x) GCHHS to ensure that a long term strategy for governance and accountability of the Diagnostic Imaging Department is developed and implemented as a matter or urgency. The GCHHS Board Safety, Quality and Engagement Committee has already greatly enhanced and strengthened governance and oversight of radiology reporting within the GCHHS.

(b) In relation to the remedial actions by GCHHS to address low reporting rates, Dr Herkes and Dr Sprague recommend that:

(i) It is the belief of Dr Herkes and Dr Sprague that the culture within the Diagnostic Imaging Department needs to change such that all investigations are reported in-house and that everyone employed in the GCHHS is responsible for achieving this.

(A) Dr Herkes and Dr Sprague are aware that in some centres this issue is addressed by ensuring that radiologists do not leave the facility until all daytime reports have been completed.

(B) This may involve scheduling two to three hours general reporting for each radiologist per day.

(ii) Robust ongoing reporting and KPIs to be implemented in order to track report completion and these to be provided to the Director of the Diagnostic Imaging Department on a weekly basis and reported quarterly to the Safety and Quality Committee of the Board.

(iii) The clinical managers of the Diagnostic Imaging Department should also be required to undertake focussed training in business management, preferably in relation to management of a health workforce.

(c) In relation to achieving and sustaining clinically acceptable rates, Dr Herkes and Dr Sprague recommend that:

(i) The Clinical Governance Committee should escalate any failure to meet quarterly KPIs to the Safety, Quality and Clinical Engagement Committee of the Board with a plan for rectification;

(ii) A failure to meet KPIs for two or more consecutive quarters, or for two out of four quarters within a given reporting year, should be reported by the Board Chair to the Director General of Health and the Minister of Health with a plan for rectification.

(d) In relation to whether the proposed actions of the Medical Imaging Reform Project adequate to address the backlog and ensure that GCHHS sustains a clinically acceptable reporting level, Dr Herkes and Dr Sprague recommend that:

(i) the retrospective review should be completed in a timely fashion and should be complete by the end of October 2014;

(ii) the senior clinical triage of abnormal findings to ensure that abnormal results should be relayed to the patient and their general practitioner by the end of October 2014;[8]

(iii) the retrospective review should be transparent and GCHHS should publish the rate of undiscovered abnormalities on plain film studies in order further the understanding of the risks to patients of unreported plain studies;

[8] The GCHHS Board Chair and Chief Executive are aware of these proposed time frames and have advised that they agree it is appropriate and have already taken steps to ensure it is met.

(iv) new management reporting at GCHHS needs to monitor ongoing reporting of all diagnostic imaging modalities to ensure that there is no future recurrence of under-reporting rates of radiology in the GCHHS.

4. Part B – Assessment of radiology reporting rates at other Hospital and Health Services

4.1 Part B Findings

(a) In relation to the desktop review of radiology reporting rates by other Hospital and Health Services for the period 1 July 2011 to 30 June 2014 from data held by Queensland Health, Dr Herkes and Dr Sprague formed the view that:

(i) most of the 17 HHSs are achieving a reporting rate within the clinically acceptable range;

(ii) of the five larger HHSs (that is, excluding GCHHS), all have consistently achieved over 90% reporting rates within 24 hours since 2012;

(iii) remote HHSs such as Torres and Cape HHS appear to have achieved acceptable reporting rates during the relevant period.

(b) In relation to identification of other Hospital and Health Services that had lower than clinically acceptable radiology reporting rates, Dr Herkes and Dr Sprague found that:

(i) Darling Downs HHS and West Moreton HHS are the only services which were identified as having a technically lower than clinically acceptable reporting rate for some of the period under review.

(ii) That said, both HHSs were only slightly under the rate adopted by Dr Herkes and Dr Sprague for the purposes of this report in the period 2012 to 2013, at respectively, 78% and 79%. Both HHSs improved in the most recent 2013 to 2014 reporting year to, respectively, 80% and 85%

(c) In relation to policy, procedure and practice review of those Hospital and Health Services that had lower than clinically acceptable radiology reporting rates, Dr Herkes and Dr Sprague formed the view that:

(i) while DDHHS had issued work instructions from time to time it has not developed prescriptive guidelines and benchmarks applicable to its respective settings.

(d) In relation to the reasons identified for the other Hospital and Health Services that had lower than clinically acceptable radiology reporting rates, Dr Herkes and Dr Sprague formed the view that:

(i) Darling Downs explained some difficulties with attracting and recruiting specialist radiology staff, however, it needs to be reiterated that this HHS was not found to have had a sustained or ongoing lower than acceptable reporting rate and in the most recent reporting period, it had an acceptable rate.

(e) In relation to strategies that could be implemented to achieve and sustain a clinically acceptable level at the other Hospital and Health Services, Dr Herkes and Dr Sprague formed the view that:

(i) very few HHSs had developed prescriptive guidelines and benchmarks applicable to their respective settings;

(ii) West Moreton has a local procedure which Dr Herkes and Dr Sprague have recommended be adopted and implemented at every HHS;

(iii) Sunshine Coast HHS also reported it had established internal standards for clinical reporting which are now audited on a monthly basis

(iv) Some HHSs advised that they had ensured their third party agreements for any outsourced radiology reporting required from time to time had built in KPIs to the contracts.

4.2 Part B Recommendations

(a) In relation to the strategies that could be implemented to achieve and sustain a clinically acceptable level at other Hospital and Health Services that have lower than clinically acceptable radiology reporting rates, Dr Herkes and Dr Sprague recommend:

(i) all HHSs to adopt and implement a procedure consistent with that in use at West Moreton HHS, albeit amended to reflect the time frames advocated in this report;

(ii) all HHSs, when outsourcing the task of radiology reporting, to ensure they clearly establish in contractual documents appropriate KPI expectations consistent with those recommended in sections 2.2 and 10.2 in this report.

5. Part C – Assessment of governance of radiology reporting rates by Health Support Queensland

5.1 Part C Findings

(a) In relation to the governance processes for HSQ to identify, escalate and manage a deterioration in HHS performance in relation to radiology reporting rates and medical imaging data, Dr Herkes and Dr Sprague formed the view that:

(i) HSQ monitors diagnostic imaging across the state and reports annually about this to the local HHSs and to Queensland Health. It appears that since the devolution of health services away from a centralised system, HSQ , while recognising the need for robust comparative reporting of Diagnostic Imaging Departments throughput across Queensland, has not appreciated the methods that could be used to fulfil an ongoing clinical governance function.

(ii) The Radiology Support Group has not used the HSQ and HHS Boards to highlight and escalate underperformance or other clinical issues when concerns arise, both within and outside of the annual reporting function.

5.2 Part C Recommendations

(a) In relation to the effective arrangements which could be implemented statewide to ensure reporting levels are sustained a clinically acceptable level, Dr Herkes and Dr Sprague recommend:

(i) The advantage of having central oversight of the performance of HHSs for key priority areas cannot be underestimated. Diagnostic imaging has become a major driver of improving patient outcomes and decreasing patient morbidity. Regardless of the ultimate configuration and governance of Diagnostic Imaging Departments within HHSs, it is vital that standardised public reporting is available for all public diagnostic imaging services across Queensland.

(ii) To improve the rate of radiology study reporting across the State, HSQ continue to evolve consistent definitions to allow the collection of standardised data across Queensland and to allow comparative reporting to be published. Due to the

different RISs in use within Queensland it would be easiest for data to be collected at the HHS level and collated statewide by HSQ. HSQ to develop standard business reports to be completed on a weekly basis by the Diagnostic Imaging Department of each HHS. These reports should include metrics defined by HSQ for studies performed, reporting rates, timeliness, wait times, radiologist work loads by DI Modality (plain, CT, MRI, angio, ultrasound etc).

(iii) Quarterly reports of performance including peer comparisons need to be sent to each HHS Board in relation to individual facilities. If reporting rates fall below the clinically acceptable range, having notified the relevant Diagnostic Imaging Department and the HHS Board, HSQ should seek advice from its Board and QHIP committee prior to escalating notification to the Director General of the Department of Health and/or the Minister of Health for appropriate intervention at the Board Chair level.[9]

(iv) In the medium term, reports on the functioning of all Diagnostic Imaging Departments, including reporting rates and timeliness of each modality, should be made identifiable, publicly available and promulgated. As a first step, these reports should be interpreted by the QHIP clinical group and published by peer group without identifiers. Ultimately public reporting and transparency of performance, particularly as the health system embraces contestability, is vital.

(v) Where an HHS installs its own RIS/PACS these standardised reports should be mandated from the HHS system and reported against peers to the public.

(vi) As custodian of QRiS, HSQ needs to develop an extensive suite of business reports to include radiologist level work pattern and output to allow modern management of the Diagnostic Imaging Departments.[10]

(vii) HSQ should also specify the desired functionality and, if possible, introduce an electronic order entry system with sophisticated request support, waiting list management and order prioritisation, for implementation across the State. This would allow much better understanding and transparency of waiting times and demand across all public diagnostic imaging services.

(viii) The recommendations in the Sg2 Report and the Diagnostic Imaging Strategy 2013 to 2017 are sound and would significantly improve diagnostic imaging practices across the State. A senior sponsor within one of the HHSs should be given carriage of the report recommendations, with a brief to adapt it to the new devolved environment and then commence implementation.

(ix) To meet this objective, the following steps should be implemented as a matter of priority:[11]

(A) the Imaging Strategy 2013 to 2017 should be endorsed by the senior management team (SMT) of the Department of Health;

(B) the Imaging Strategy 2013 to 2017 should be presented to the Chief Executives and Chairs of the 16 HHSs;

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[9] HSQ has advised they have commenced developing a governance protocol to monitor radiology reporting performance which includes an escalation process to the Director General as well as the HHS Board for a major non-conformance: Letter HSQ to Investigators 17 October 2014.

[10] HSQ has been working with QRiS to expand business reporting capability: Letter HSQ to Investigators 17 October 2014.

[11] Dr Herkes and Dr Sprague appreciate HSQ's priority support for these recommendations: Letter HSQ to Investigators 17 October 2014.

(C) a business case should be developed to identify the responsibilities of the whole of State versus the responsibilities of the HHSs in order to provide a mechanism to determine the investment requirements at a whole of State level;

(D) a small business unit preferably based in HSQ should be identified, including a project manager, to oversee the development and management of the business case for the implementation of the Imaging Strategic Plan 2013-2017;

(E) the Clinical Radiology Group should continue to be supported by Qld Health Imaging Program (QHIP) with enhanced responsibility to monitor data for audit and feedback for the HHS CEs, Boards and Minister.

(x) Transparency and accountability must be implemented across the system, including to ensure there are clear and consistently applied data definitions, collection criteria and data integrity processes.

END OF EXECUTIVE SUMMARY

6. Appointment

6.1 Authority

(a) Pursuant to instruments of appointment dated 25 July 2014, Dr Robert Herkes, Dr Paul Sprague and Ms Megan Fairweather of Minter Ellison Lawyers were jointly appointed by the Director-General, Department of Health pursuant to Part 9 of the *Hospital and Health Boards Act 2011* (Qld) as health service investigators.

(b) Extensions of time for the delivery of the final report were granted by the Deputy Director-General on 6 September 2014, by the Director General on 23 September 2014 and a further extension request was made of the Director General on 22 September 2014.

(c) A copy of the instruments of appointment together with the terms of reference are contained in **Annexure A** to this report.

6.2 Scope of the investigation

(a) The investigators were appointed to investigate and report on matters relating to the management, administration or delivery of public sector health services at Gold Coast Hospital and Health Service (**GCHHS**).

(b) The instruments of appointment and terms of reference require the investigation and report to proceed in three parts:

(i) **Part A**: to assess the low reporting of radiology at GCHHS including to consider:

(A) What is a clinically acceptable reporting level of radiology?

(B) What are the relevant national and statewide policies and procedures for review and reporting of radiology?

(C) What are the policies and procedures for review and reporting of radiology at GCHHS?

(D) Were the GCHHS radiology review reporting practices consistent with national and statewide reporting standards and guidelines between 1 July 2011 and 30 June 2014?

(E) Why does the GCHHS have lower than expected radiology reporting rates?

(F) What remedial actions have been taken by the GCHHS to address low radiology reporting rates?

(G) Are those remedial actions adequate to achieve and sustain clinically acceptable radiology reporting rates?

(H) In particular, are the proposed actions of the Medical Imaging Reform Project adequate to address the backlog and ensure that GCHHS sustains a clinically acceptable reporting level?

(ii) **Part B**: to assess if there are any other Hospital and Health Services that are not achieving a clinically acceptable reporting rate for radiology, understand why and identify strategies to enable achievement of a clinically acceptable level including to consider:

(A) Identify if any other Hospital and Health Service has a radiology reporting rate that is below a clinically acceptable level by conducting a desktop review of radiology reporting rates by the HHSs for the period 1 July 2011 to 30 June 2014 from data held by Queensland Health; and

(B) For any HHS that has a lower than clinically acceptable radiology reporting level:

(I) undertake a review of the HHS radiology review and reporting policies, procedures and practices to determine the reasons for that lower than clinically acceptable radiology reporting rate; and

(II) identify strategies that could be implemented to achieve and sustain a clinically acceptable level.

(iii) **Part C**: to assess the governance of Health Support Queensland (**HSQ**) in the identification, escalation and management of Hospital and Health Services reporting of radiology and identify effective arrangements which can be implemented statewide to ensure reporting levels are sustained at a clinically acceptable level including to consider:

(A) What are the governance processes for HSQ to identify, escalate and manage a deterioration in HHS performance:

(I) in relation to radiology reporting rates;

(II) in relation to medical imaging.

(B) Identify effective arrangements which can be implemented statewide to ensure reporting levels are sustained a clinically acceptable level.

(c) The investigators have been asked to make findings and recommend strategies that could be implemented statewide to enable radiology reporting levels to be sustained at a clinically acceptable level

(d) The report is provided to the Director-General pursuant to section 199 of the *Hospital and Health Boards Act 2011* (Qld).

7. Methodology

7.1 Interviews

(a) Based on a comprehensive review of policies, reports, organisational charts and other documentation, Dr Herkes and Dr Sprague identified a number of staff at GCHHS, Health Support Queensland and GCHHS Board members who would, in principle, be able to cast light on the radiology reporting practices at the GCHHS and throughout Queensland public sector hospitals.

(b) A total of 34 persons were interviewed, including members of the executive, senior clinical managers, clinical staff, former clinical staff, GCHHS Board members and senior managers of Health Support Queensland. The full list of persons interviewed is set out in **Annexure B** to this report.

(c) The majority of interviews were conducted face-to-face by Dr Herkes and Dr Sprague during a visit to Health Support Queensland, Herston and Gold Coast University Hospital in August 2014. All interviews were documented by Dr Herkes and Dr Sprague taking contemporaneous notes.

(d) Relevant portions of the contemporaneous notes taken during interviews are referred to in this report, as required by the terms of reference.

7.2 Written responses

(a) An invitation was extended to every HHS, other than GCHHS, to advise about the existence of any local policy or procedure relating to radiology reporting. Written responses were provided by nine of the 15 other HHSs.

(b) Written responses were also received following a limited release of draft extracts of variously, Part A, Part B and Part C for the purposes described in 7.4(d) below as well as to ensure factual accuracy of the contents and for consultation to ensure that the recommendations being considered were meaningful and practically achievable. These responses are not available to be provided without the written consent of the authors.

7.3 Documents collected

(a) Pursuant to the powers conferred on investigators by section 194 of the *Hospital and Health Boards Act 2011* (Qld), the investigators sought documentation from:

(i) Gold Coast Hospital and Health Service; and

(ii) Health Support Queensland.

(b) The terms of reference directed the investigators to have particular regard to the following accepted standards of practice:

(i) statewide and national clinically accepted radiology reporting rates.

(c) The documents collected during the investigation are in excess of 200 and those reviewed are listed in **Annexure C** to this report.

(d) Dr Herkes and Dr Sprague also had regard to publicly available policies as listed in **Annexure D**.

(e) Given the extent of the information collected, not all documents have been appended to the report. However, the evidence relied upon for the findings is specifically referenced in the report and copies of each of the collected documents are available upon request, subject to any claim for privilege, confidentiality or privacy.

7.4 Evidence

(a) This report sets out the evidence that is credible, relevant and significant to the matters under investigation in relation to each matter.

(b) All evidence provided has been taken into consideration, although it may not specifically be referred to in this report.

(c) The investigation proceeded in accordance with the principles of natural justice.

(d) Nine individuals and entities were notified of the potential for adverse comment to be made in the report and were provided with the opportunity to respond to the identified issues.

7.5 Confidentiality of individuals

(a) In accordance with the terms of reference, the names of individuals who provided information to the investigators have not been identified in this report.

8. Limitations

(a) Although there were three investigators appointed by the Director-General, in accordance with direction from the Department of Health, the interviews and document review was conducted by Dr Herkes and Dr Sprague. The role of Ms Fairweather of Minter Ellison Lawyers was limited to assisting Dr Herkes and Dr Sprague in relation to procedural matters during the investigation and in assisting the finalisation of the report in particular to advise on compliance with the terms of reference. The analysis of evidence, findings and recommendations set out in this report are those of Dr Herkes and Dr Sprague.

(b) While two of the investigators are medical practitioners, Dr Herkes and Dr Sprague have not made any clinical findings regarding the standard or quality of clinical care provided to patients at Gold Coast University Hospital.

(c) While one of the investigators is a lawyer, the report should not be relied upon as legal advice. No legal conclusions are made in the report. The investigators have not acted in the capacity of lawyers for the Director-General, the Department of Health or any other person involved in this investigation.

(d) The investigators reserve the right to alter the findings reached in this report should information that is relevant to the findings subsequently become available after the date of this report. However, the investigators assume no responsibility for updating this report for events and circumstances occurring after the date of this report.

(e) This report has been prepared exclusively for the Director-General and the purposes identified in the instrument of appointment and the statutory purposes prescribed in the *Hospital and Health Boards Act 2011* (Qld). It should not be distributed, used or relied on for any other purpose or without the written consent of the investigators. If it is, the investigators do not accept any liability or responsibility for loss suffered by any party.

9. Overview of assessment of evidence

(a) The terms of reference require the making of findings and recommendations in relation to:

  (i) The ways in which the management, administration or delivery of public health sector health service can be maintained and improved with particular regard to the following:

    (A) the ways in which timely reporting of radiology reports at GCHHS can be improved and maintained;

    (B) the incidence of and strategies to improve low reporting rates of radiology reports across the State;

    (C) the use by Queensland Health of medical imaging data, including reporting of radiology reports, received from Hospital and Health Services;

    (D) effective arrangements to ensure reporting levels are sustained at a clinical acceptable level across the State; and

    (E) any other matter identified during the course of the investigation.

(b) The evidence was assessed to provide a report as requested.

(c) The report considers:

  (i) performance of diagnostic imaging services at GCHHS;

  (ii) the policy context at the local GCHHS, State and National levels; and

(iii) governance and management structures at Health Support Queensland

(d) The report takes an approach that aims to reflect on past efforts to improve radiology reporting rates at GCHHS and then attempts to offer constructive and practical recommendations about how to build and sustain improvement in the longer term, taking into account policy, workflow practice and procedure and culture.

Part A – Assessment of low radiology reporting rate at GCHHS

10. Assessment of GCHHS radiology reporting policy and procedure

10.1 Scope

(a) Dr Herkes and Dr Sprague were asked to consider whether the GCHHS policies and procedures for review and reporting of radiology are in line with national and statewide standards and guidelines.

10.2 What is a clinically acceptable reporting level for radiology?

(a) In order to respond meaningfully to the questions raised by the terms of reference, a critical threshold issue to establish is what is a clinically acceptable radiology reporting rate. An assessment of rate needs to account for the patient's clinical status, the type of image being performed and the expected time frame for the result to be available.

(b) The expectation of the community and clinicians is that all diagnostic imaging procedures require a report, by a radiologist, in a timely manner, with the timeframe dictated by the patient's condition and setting. Emergency department patients need to have images reported within an hour to meet NEAT requirements, while those presenting for follow up in a cancer clinic would need the images reported within 24 hours.

(c) There is no requirement for a specialist radiologist report where the imaging is performed during a procedure, for the purposes of intraoperative guidance, provided the clinician performing the procedure records the results of the imaging as part of the operative note.[12] There may also be circumstances where the clinical circumstances may warrant the clinician to request a report.[13] All post-operative imaging requires a formal radiologist report.

(d) By way of practical guidance about acceptable radiology reporting rates, the Australian mean reporting rate is 13,600 reports per FTE per annum. The Royal Australian and New Zealand College of Radiologists (RANZCR) suggests a rate of 10,000 reports per FTE per annum.

(e) Dr Herkes and Dr Sprague consider that for the purposes of adopting a benchmark for the purposes of this report, at least 90% of films should have formal specialist radiology reports and that 80% of these should be completed within 24 hours. For many Diagnostic Imaging Departments sub-specialty demands including meeting the timeframes recommended by NEAT may necessitate many of these studies being reported in an even more timely manner.[14]

(f) Dr Herkes and Dr Sprague have adopted these figures on the assumption that around 10% of imaging will be taken intraoperatively (and thus will not require a formal report) and around 20% of imaging may be non-urgent and not possible to report on within 24 hours (for example images taken in regional or remote facilities on weekends).

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[12] For example, imaging during surgical plating of a fracture required to ensure correct screw placement.
[13] For example, a formal report may be required to be made during an ERCP and cholangiography as a part of a cholecystectomy procedure.
[14] Dr Herkes and Dr Sprague have recommended the implementation of a Relative Value Unit scheme as a more accurate and suitable method of establishing individual key performance indicators and for monitoring and auditing the performance of a diagnostic imaging department generally. Refer to the recommendation in section 13.8 below.

(g) Dr Herkes and Dr Sprague wish to reiterate their expectation for a tertiary facility is that diagnostic images which require formal reporting should be reported within the time frames appropriate to the clinical situation (paragraph (b) above) in 100% of cases.

10.3 Relevant national and statewide policies and procedures for review and reporting of radiology

(a) Current national standards from the Royal Australian and New Zealand College of Radiologists (RANZCR) expect that every diagnostic image ordered is reported upon by a qualified radiologist in a timely fashion.[15]

(b) The Queensland Health Guideline for Diagnostic Imaging Reports states:[16]

(i) Queensland patients require timely access to appropriate diagnostic imaging services to enable the most appropriate choice of treatment.

(ii) A diagnostic imaging service shall comprise both a diagnostic imaging procedure and a report on that procedure within a clinically appropriate timeframe.

(iii) An appropriately credentialed radiologist or medical practitioner shall be responsible for the supervision, interpretation and reporting of the diagnostic imaging procedure. All or part of the report preparation may be delegated to a suitably qualified practitioner; all authors shall be identified on the report.

(iv) The report must be made available to the referring clinician as part of the patient's medical record, i.e. the patient chart or relevant information system. Where diagnostic imaging is provided in conjunction with a surgical procedure, the findings may be noted in the patient record and included or referenced in the radiology report.

(v) The report shall be available at a time appropriate to inform a clinical decision. This includes taking all reasonable steps to advise the requesting clinician about urgent or unexpected findings.

(c) Similarly, the Medicare Schedule states that, to attract a Medicare benefit, the records must include a written report by the practitioner providing the diagnostic imaging service.[7] For ultrasound services, where the service is performed on behalf of a medical practitioner, the report must record the name of the sonographer.

10.4 Policies and procedures for review and reporting of radiology at GCHHS

(a) Dr Herkes and Dr Sprague were unable to find any evidence of a general diagnostic imaging reporting policy, procedure or work practice guideline within GCHHS or evidence that the national and Queensland Health policies and guidelines had been implemented locally.

(b) Dr Herkes and Dr Sprague acknowledge that the Queensland Health Guideline for the Provision of Diagnostic Imaging Reports is overarching rather than prescriptive as outlined in section 10.3(b) above. They also acknowledge, as discussed in more detail in section 13.4 below, that very few of the other 15 HHSs in Queensland have implemented a detailed or prescriptive local guideline or procedure.

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[15] RANZCR Standards of Practice for Diagnostic and Interventional Radiology V 9.2 Section 5-5-3 Communication of Imaging Findings and Reports accessed online at http://ranzcr.edu.au/component/docman/doc_download/510-ranzcr-standards-of-practice-for-diagnostic-and-interventional-radiology

[16] Queensland Health Policy QH-GDL-017:2013

[7] Medical Benefits Schedule

(c) In 2012, a written protocol was developed at the Gold Coast Hospital which aimed to flag plain films that had not been reported within a time frame of three days. The protocol was to ensure that diagnostic imaging taken for emergency department, intensive care unit and ward admitted patients were highlighted for priority reporting within the Radiology Information System (RIS).[17]

(d) Given the consistently low radiology reporting rates at GCHHS since that time, as outlined under the next heading, the protocol appears to have had little, if any, practical effect.

(e) There is also a protocol at GCHHS for the preferential reporting of privately insured patient films.[18]

10.5 Summary findings about reporting policy and procedure

(a) In relation to GCHHS radiology reporting policy and procedure, Dr Herkes and Dr Sprague have formed the view that:

(i) The GCHHS has inadequate policies, procedures or guidelines to appropriately manage its Diagnostic Imaging Department. Policies and guidelines which exist at a state and national level have not been implemented at GCHHS.

(ii) The 2012 protocol to improve the radiology reporting rates for patients undergoing diagnostic imaging in the emergency department, intensive care unit and during ward admission was not effective.

10.6 Recommendations for radiology reporting policy and procedure

(a) Dr Herkes and Dr Sprague have provided their recommendations about radiology reporting policy and procedure at GCHHS in Part B of this report, section 13.8 below.

11. Assess the practice of GCHHS for review and reporting of radiology against national and statewide standards and guidelines for the period 1 July 2011 to 30 June 2014

11.1 Scope

(a) Dr Herkes and Dr Sprague were asked to assess the practice of GCHHS for review and reporting of radiology against national and statewide standards and guidelines for the period 1 July 2011 and 30 June 2014.

(b) If it was identified that GCHHS had lower than clinically acceptable radiology reporting rates, Dr Herkes and Dr Sprague were asked to identify the reasons.

11.2 Were the GCHHS radiology review reporting practices consistent with national and statewide reporting standards and guidelines for the period 1 July 2011 to 30 June 2014

(a) Dr Herkes and Dr Sprague found that the GCHHS reporting practices since 1 July 2011 were not consistent with statewide or national reporting benchmarks. The data reviewed by Dr Herkes and Dr Sprague revealed that GCHHS has had a consistently poor reporting rate for diagnostic imaging services since at least 1 July 2011. That is not to say that there have not been times when GCHHS has been able to achieve clinically acceptable reporting targets, albeit, for short periods.[19]

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[8] Protocol No. MIDCR0069v2
[9] Protocol No. MIDCR0036v5
[19] An example in the period of July 2013 (see Figure 2 below).

(b) More specifically, the GCHHS Diagnostic Imaging Department failed to make a formal report for over half of the patients who underwent diagnostic imaging studies between 1 July 2011 and 30 June 2014. That is, out of approximately 495,000 studies performed at GCHHS in the investigation period of July 2011 to June 2014, only 258,000 were formally reported. For those patients whose studies were reported, the reports were frequently not available within 24 hours.

(c) Dr Herkes and Dr Sprague were informed in interviews and in written responses to a draft of this Part A of the report, that cross-sectional imaging (CT and MRI) were close to 100% reported.[20]

(d) The GCHHS radiology reporting rates are the lowest in the Queensland public hospital system[21], noting that improvements have been made in recent times.[22]

Table 1: Reporting data for GCHHS between 2011 and 2014

	2011 to 2012	2012 to 2013	2013 to 2014
Examinations	152,227	165,671	178,519
Reported	63,646	76,320	117,998
Reporting Rate	42%	46%	66%
24 Hour Compliance	38,290	53,033	60,268
24 Hour Rate	25%	32%	34%
Radiologist FTE	10.75	13.05	
Registrars	11.1	10.14	
Reporting per FTE	5950	5840	

(e) In 2013 a significant effort was made to improve reporting rates using a combination of new radiologist appointments and by outsourcing much of the plain film reporting. This transiently achieved plain film reporting rates of over 90%.[23]

(f) In September 2013, there was a move from the Gold Coast District Hospital to the Gold Coast University Hospital and this saw a deterioration in reporting rates, not just at the Gold Coast Hospital facilities but the other facilities within the GCHHS. These rates then progressively declined over the next three months. By December 2013, the plain film radiology reporting rates were below 40% across each GCHHS facility.

(g) Dr Herkes and Dr Sprague do not underestimate the impact that the move to a new hospital facility likely had on the ability to maintaining the recently improved reporting rates during a nominal settling in period. It is important to note however that the reporting rates following the move were consistent with the reporting rates that existed before certain measures were taken by the current Chief Executive in early 2013 when no such issues existed (see further discussion in section 11.8(c) below).

[20] Dr Herkes and Dr Sprague were not provided with any documentary evidence to support this contention, however, they have no reason to doubt it was not earnestly made.
[21] The statewide desktop analysis of radiology reporting rates is discussed in Part B of this investigation report.
[22] The recent improvements in radiology reporting rates at GCHHS are discussed in section 12 below.
[23] There was a short period of improvement between May and September 2013 following identification of the issue by the current Chief Executive GCHHS in early 2013. See further discussion about this at section 11.8(c) below

Figure 1: Plain film reporting at the Gold Coast Hospitals July 2013 to January 2014

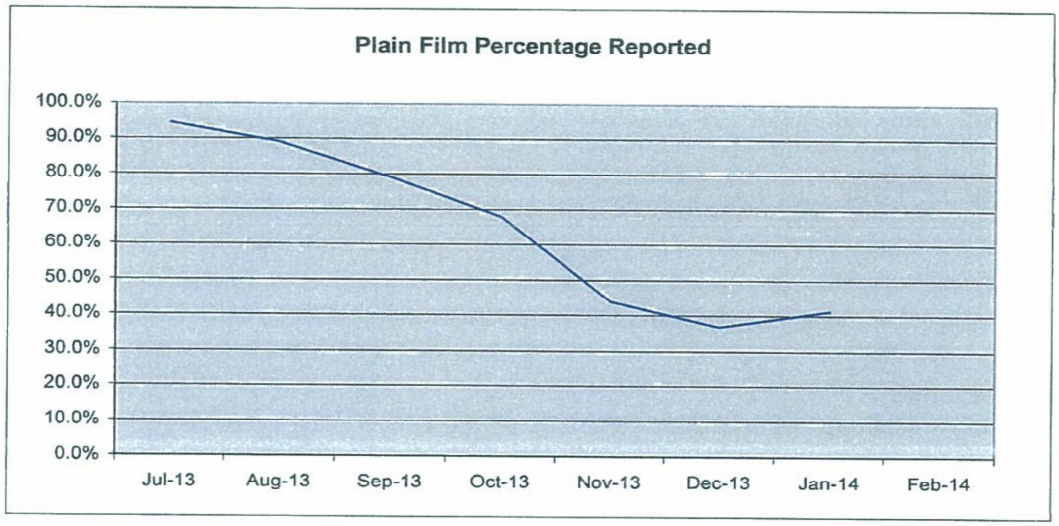

Figure 2: Plain film reporting across GCHHS July 2013 to January 2014

PLAIN FILM

		Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14
GCH									
	Total exams taken	5180	5121	4225	0	0	0	0	
	Total exams not reported	203	616	1122					
Percentage Reported		**96.1%**	**88.0%**	**73.4%**					
GCUH									
	Total exams taken	0	0	353	5355	5388	5299	5622	
	Total exams not reported			78	2016	3118	3331	3376	
Percentage Reported				**77.9%**	**62.4%**	**42.1%**	**37.1%**	**40.0%**	
Robina									
	Total exams taken	3929	3909	3994	3919	3648	3526	3559	
	Total exams not reported	307	380	594	962	1949	2245	2012	
Percentage Reported		**92.2%**	**90.3%**	**85.1%**	**75.5%**	**46.6%**	**36.3%**	**43.5%**	
District Combined									
	Total exams taken	**9109**	**9030**	**8572**	**9274**	**9036**	**8825**	**9181**	
	Total exams not reported	**510**	**996**	**1794**	**2978**	**5067**	**5576**	**5388**	
Percentage Reported		**94.4%**	**89.0%**	**79.1%**	**67.9%**	**43.9%**	**36.8%**	**41.3%**	

11.3 Practice issues impacting on GCHHS's ability to achieve clinically acceptable radiology reporting rates for the period 1 July 2011 to 30 June 2014

(a) Dr Herkes and Dr Sprague were informed during witness conferences about certain potential historical reasons for the lower than clinically acceptable radiology reporting rates. They have, however, confined their report to the period described by the terms of reference, that is, the period between 1 July 2011 to 30 June 2014.

(b) A number of issues were raised by witnesses in an effort to explain the more recent failures at GCHHS to meet national and state reporting benchmarks, despite management intervention and the allocation of significant new funds.[24] Many of the individuals spoken to were strongly of the view that the reasons for the ongoing low radiology reporting rates were multi-factorial. The issues cited included:

[24] The remedial steps taken more recently by GCHHS and their effectiveness are discussed under section 12 below.

(i) the disruptions involved with the move into the new Gold Coast University Hospital and Diagnostic Imaging Department;

(ii) the recent doctor's "*contracts dispute*" with the loss of some senior radiologists and disruption to the work patterns of others;

(iii) increasing work loads as the Gold Coast University Hospital transitions to a full range of tertiary services including the introduction of a neonatal intensive unit, neurointerventional radiology, PET scanning, a trauma service and full cancer services;

(iv) the slowness of the Radiology Information System/ Picture Archiving and Communication System (RIS/PACS) system;

(v) continual workflow interruptions, particularly affecting the plain film reporting consultant, who is frequently disturbed to interpret unclear request forms, advise on clinical priority and chase up missing information from the ordering doctors;

(vi) lack of a patient centred focus, such that the pivotal role the Diagnostic Imaging Department plays in the successful delivery of patient care was lost.

(c) While Dr Herkes and Dr Sprague agree that these are all likely to be contributing factors, the low reporting rates issue was an entrenched state of affairs at the commencement of the period under investigation whereas most of the issues highlighted by those interviewed have really only arisen from around September 2013.

(d) Dr Herkes and Dr Sprague identified that there were significant cultural, governance and business process issues contributing to the ongoing poor reporting rates, and these issues were exacerbated by a lack of management data.

11.4 Governance and cultural barriers

(a) Dr Herkes and Dr Sprague identified through staff interviews that the following cultural and governance issues may be having a direct impact on the low radiology reporting rates:

(i) there is not a culture amongst individual radiology staff of reporting each day's work on the same day;

(ii) the new Diagnostic Imaging Department is so large it is easy to escape to an office to undertake personally interesting work without necessarily helping the group deliver the core patient care;

(iii) previous leaders of the Diagnostic Imaging Department were admired clinicians and experienced leaders who contributed greatly to the specialty, but were not given training in business management, and were not well supported with modern administrative systems or performance reports;

(iv) the low radiology reporting was documented in the hospital risk register but without evidence of a concerted response to address this at the GCHHS senior governance level until 2013.

(b) It appeared to Dr Herkes and Dr Sprague that the entire hospital had come to accept that plain film x-ray reports were not a priority or even required.[25] There was no evidence of any groundswell of concern about the lack of radiology reporting across the board.

[25] Dr Herkes and Dr Sprague were informed about a recent proposal for limited radiographer reporting of some plain films. This was not adopted because it was not considered to be within the scope of practice of a radiographer and the idea was not supported by the RANZCR

(c) Dr Herkes and Dr Sprague were also made aware that concerns had been expressed in writing before the period described in the terms of reference. They have however confined their review to the period under review.

(d) One email obtained during the course of the investigation observed that:[26]

> *The issues are twofold:*
>
> > *The MID is not coping with the supply and demand across all modalities. They have retained the "old" ways of working and brought them to GCUH which is very different. They are not retaining their medical workforce which is causing unrest. They are not taking advantage of the new technology that is available to manage stores and stock control. What I wanted was for an investigation into the area to develop solutions.*
> >
> > *Ultrasound is a supply and demand issue but dependant on a workforce that is very difficult to recruit to at this time. This situation will not be the case in two years where there will be a shortage of sonographers. Therefore, it makes sense to consider outsourcing this, whether that be a provider occupying the space and delivering the service or contracted staff is up for consideration.*
>
> *It would be worth going through a contestability framework.*

(e) The email went on to say that there were numerous issues within the Diagnostic Imaging Department. The concern was that there had been a "*piecemeal approach*" to problem solving when there are clearly a bigger picture issues to resolve. That is, in relation to the manner in which a tertiary medical imaging department should manage the following:

(i) workload;

(ii) stock control; and

(iii) general workforce issues.

(f) The author of the email recommended an external review of the Diagnostic Imaging Department to review the systems, processes, culture and gaps.

(g) Numerous other deficiencies relating to governance and oversight were reported to Dr Herkes and Dr Sprague during their visit to GCHHS for the purposes of this investigation. These included a perceived lack of leadership, absence of transparency and responsibility, individual and group underperformance, and contractual deficiencies with the outsourcing of radiology reports.

(h) Dr Herkes and Dr Sprague are also concerned about the lack of performance management within the Diagnostic Imaging Department. They found no evidence of a clear set of key performance indicators for either individual staff or for the Diagnostic Imaging Department as a whole.

11.5 Workflow and business processes

(a) Dr Herkes and Dr Sprague consider that clearly identified business processes with associated technology support systems are essential elements to achieving clinically acceptable radiology reporting rates and building a positive patient safety culture around the importance of producing reports.

[26] Email dated in March 2014.

(b) The general view expressed to Dr Herkes and Dr Sprague in interviews was that the Gold Coast University Hospital lacked business performance reports that matched its new and expanded tertiary hospital functions.[27]

(c) Dr Herkes and Dr Sprague were pleased to see the use of a dedicated plain film reporting room with a combination of consultants and registrars working together in the new Diagnostic Imaging Department. However, the sheer size of the department and the lack of easy communication technology means that a significant amount of time is spent searching for personnel.

(d) A repetitive theme raised in the interviews concerned constant interruptions to both radiographers and radiologists.

(e) The administration processes within the department are also significantly outdated, especially around processing orders and scheduling investigations. The Diagnostic Imaging Department still operates on paper request forms and so senior staff spend significant time reviewing request forms, many of which lack basic information, necessitating them to chase critical patient data.[28]

(f) Dr Herkes and Dr Sprague also consider there is a lack of management data being collected. The Diagnostic Imaging Department does not have a centralised and streamlined business process or information technology system to track appointment waiting lists, patient prioritisation and ensuring follow up of patients who miss their appointments.

(g) Similarly, the work performed by individual staff members and the work performed using each piece of equipment is not recorded, monitored or reviewed.

(h) RANZCR considers an acceptable work load to be between 10,000 and 12,000 examinations per FTE radiologist per annum (as noted above).

(i) Dr Herkes and Dr Sprague consider that a Relative Value Unit (RVU) scheme would more adequately recognise that there are inherently different requirements for the various imaging modalities. The RANZCR, in particular, recognises that, due to increasing case complexity and clinical need for more cross sectional imaging, and taking into account issues related to individual caseload, imaging modality, clinical meetings and teaching, there is a requirement for new criteria to assess workloads.

(j) Dr Herkes and Dr Sprague are aware that RANZCR supports the development of RVUs for diagnostic imaging examinations to more accurately determine workloads. Some hospitals have developed their own RVUs utilising two minutes per plain film examination that is a rate of 30 per hour.[29]

(k) An RVU scheme would enable the development of accurately defined benchmarking for both individual performance as well as for the entire Diagnostic Imaging Department.

(l) Current practices such as block booking lunch breaks should also be reviewed.

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[27] Issues were raised about the reliability of reports produced from the state sponsored RIS system, however, Dr Herkes and Dr Sprague were not satisfied this was a complete explanation for the low reporting rates at GCHHS.
[28] Examples cited in interview were the referring doctor's contact details, patient location, patient renal function, relevant medical history. This was also attributed by some to defects in the functionality of the RIS system, and if that is the case, then this may well be a state-wide issue.
[29] That is, to achieve radiology reporting rates that are generally consistent with the Australian mean reporting rate of 13,600 reports per FTE per annum, or the RANZCR recommended rate of 10,000 reports per FTE per annum.

11.6 Existing information technology systems

(a) Dr Herkes and Dr Sprague were informed that the RIS is a system operated by a third party which has an overarching agreement with the Department of Health. The RIS is expected to be used in all HHSs, including at GCHHS.

(b) The RIS/ PACS system in use across GCHHS is reportedly very slow. The interface from the RIS can take over 20 seconds to catch up with the current patient being viewed in the PACS. Effective processing systems are expected to transmit images almost immediately.

(c) Witnesses also reported that the speech recognition software does not always accurately transcribe the radiologist's reports.

(d) It has been observed that, to achieve 100% reporting on all plain films at the GCHHS, a radiologist should report a minimum of 16 plain x-ray studies each hour as long as the department was resourced with one consultant and two registrars dedicated to this task for 40 hours per week. Dr Herkes and Dr Sprague are of the view that the minimum expectation should be much higher than 16 and closer to 30 per hour and consider that with limited distractions and good business support systems and processes this should be easily achievable.

(e) Dr Herkes and Dr Sprague were also informed that the RIS system has not traditionally enabled the GCHHS routine access to data and reports. There is no function for the GCHHS to generate its own reports. Rather it must request and then wait for the RIS team to generate and provide the report. While a monthly report is available, this may not be sufficiently timely for identifying issues. Dr Herkes and Dr Sprague understand that the provision of daily reports was very recently introduced.[30]

11.7 Multiple equipment contracts

(a) While the new Gold Coast University Hospital Diagnostic Imaging Department has purchased high grade equipment including a PET CT scanner, multiple vendors have been chosen to provide similar machines for similar purposes. For example, there are five CT scanners in the new department, manufactured by three vendors. The three MRI machines are from two different vendors.

(b) Dr Herkes and Dr Sprague consider this configuration imposes a considerable training burden on the radiographers as each of the vendor's machines have a different interface. Individuals who wish to train as a CT Radiographer, for example, will be required to master three different CT systems.

(c) The hospital must also deal with multiple service vendors, with the potential for confusion and significantly more expensive maintenance costs.

11.8 Previous opportunities to improve not acted upon

(a) There have been numerous warning signs about the low reporting rates at GCHHS that have not been acted upon by senior clinical and executive managers, including:

(i) two ACHS[31] accreditation recommendations, the most recent of which, 21 May 2014, highlights the issues and recommends action including to review the "*risk rate*" and evaluate the impact of additional staffing on improvements to the percentage of plain film reporting;

[30] Letter Chief Executive to Investigators dated 14 October 2014, daily reports were introduced in June 2014.
[31] ACHS Radiology Clinical Indicators Version 4.

(ii) notification of concerns from trainee radiology registrars to the RANZCR; [32]

(iii) the unreported films were recorded on the Gold Coast Hospital's risk register;

(iv) the failure to meet NEAT expectations was partly driven by lack of radiology reports in 2014.

(b) There have been at least three previous external reviews into the issue, including by the Royal Australian College of Medical Administrators (RACMA), Price Waterhouse Coopers and Sg2 Health Care Intelligence. Dr Herkes and Dr Sprague are concerned that these previous reviews, which were no doubt produced at significant cost and effort, have had no apparent success thus far in improving the overall system (insofar as they relate to radiology reporting).

(c) The issue has also been documented in the annual reports from Health Support Queensland as well as in its annual letters to the GCHHS CEO and Director of the Diagnostic Imaging Department.[33]

(d) None of these flags triggered an effective resolution of the issues, at least in the long term.

11.9 Summary findings about GCHHS radiology review reporting practices and the reasons identified for the lower than clinically acceptable radiology reporting rates for the period 1 July 2011 to 30 June 2014

(a) In relation to GCHHS radiology review reporting practices, and the potential reasons for the ongoing lower than clinically acceptable radiology rates, Dr Herkes and Dr Sprague formed the view that:

(i) There were significant numbers of patients whose radiology plain x-ray films were unreported which exposed patients of GCHHS to increased clinical risk in relation to timely diagnosis and treatment.

(ii) While the diagnostic imaging reporting rate has fluctuated, it has generally been lower than clinically acceptable and deteriorated further following the transition from the Gold Coast Hospital to the Gold Coast University Hospital and the new Diagnostic Imaging Department.

(iii) Despite having been recognised by clinical governance at both state and hospital levels, and despite significant extra resources, radiology reporting rates at GCHHS remained unsatisfactory until quite recently (discussed under the next heading).

(iv) There was a lack of leadership and accountability for developing overarching prescribed workflow processes and procedures including:

(A) a lack of key performance indicators for individual staff and the Diagnostic Imaging Department as a whole including an expectation that radiology staff should not leave work until the day's reports are completed;

[32] The radiology training registrars were concerned that they would fail to attain Fellowship with RANZCR due to their inability to achieve College targets for reporting plain films (the requirement being 10,000 plain films in years 1 to3).

[33] The Chief Executive has advised that shortly after his commencement at the GCHHS he did receive this correspondence and acted immediately. The correspondence was believed to have been reviewed in around February 2013. The result was the short period of improvement to reporting rates between May 2013 and the relocation to the new hospital facilities in September 2013: Letter Chief Executive to Investigators dated 14 October 2014.

(B) a lack of management data about the work performed on each piece of equipment. As far as could be ascertained, equipment usage is not recorded, monitored or reviewed;

(C) an outdated paper-based system of managing diagnostic imaging requests and tracking patient appointments, prioritisation and follow up.

(v) The existing RIS/PACS system is too slow for the purposes of a busy tertiary centre with the RIS interface speed impacting on efficient reporting practices.

(vi) The purchase of scanning equipment from multiple vendors is likely to increase the training burden on radiology staff as well as maintenance costs.

(vii) Three previous external reviews have, at some cost and effort, examined the issues surrounding the low radiology reporting rates, but have not led to any effective or satisfactory improvement to the culture, governance and workflow processes for radiology reporting rates at GCHHS on a sustained basis.

11.10 Recommendations

(a) In relation to GCHHS review and reporting practices, Dr Herkes and Dr Sprague recommend that:

(i) a workflow review should be undertaken to ensure that processes which can be undertaken by staff in other areas of the hospital, are performed in those other areas such as, for example, cannulation;

(ii) tasks should be assigned to staff of an appropriate level, with specific training to undertake the task, to avoid the issues arising from incomplete request forms being handled outside the clerical system by clinicians (for example, clinicians having to chase up the patient's creatinine level, a measure of a renal function);

(iii) GCHHS to develop and implement policies to achieve radiologist reporting on 100% of diagnostic imaging studies that require a formal report within the time frame appropriate to the clinical situation (as outlined in paragraph 10.2 above);

(iv) GCHHS to investigate and implement a modern order entry system with appropriate decision support and appropriate management reports to allow the Diagnostic Imaging Department to optimise the care of patients. The order entry system must allow a patient to be tracked and prioritised, to optimise that care.

(A) The recommendations to Health Support Queensland in the Sg2 Report and the subsequent Diagnostic Imaging Strategy 2013-2017 are sound and would significantly improve diagnostic imaging within GCHHS and across the State;

(B) The GCHHS Board should consider sponsoring this report at a state level and champion its implementation, as a leading HHS within Queensland.

(v) GCHHS to develop business reports on a weekly basis and communicate this information to the Diagnostic Imaging Department. KPIs need to be developed to include both patient flow and staff data. Waiting lists, no-show rates, reporting turn-around times and machine utilisation should be combined with staff performance for all levels of staff within the Diagnostic Imaging Department.

(vi) Radiology reporting should include peer comparison provided by Health Support Queensland and should include modality reports (for example in each case of CT, MRI, ultrasound, plain film).

(vii) GCHHS to develop a Relative Value Unit system for diagnostic imaging reporting. The RANZCR is progressing recommendations for a National relative value unit (RVU) based work load benchmark and it would be prudent to adopt this when finalised.[34]

(viii) Department of Health and/or GCHHS to develop an information technology solution to overcome the inadequate RIS/PACS system currently in use at GCHHS. Dr Herkes and Dr Sprague recommend this could be achieved either by:

(A) Department of Health identify and engage system and infrastructure supplier for adoption at all HHSs; [35]

(B) GCHHS, which has allocated funds for such a system, to act as sponsor for a new system and infrastructure supplier with other key HHSs to test, support and implement the system on a progressive basis.[36]

(ix) GCHHS to demonstrate overwhelming clinical imperative when deciding to purchase equipment from alternative vendors to minimise the risks of user error and to ensure training and maintenance requirements are streamlined.

(x) GCHHS to ensure that a long term strategy for governance and accountability of the Diagnostic Imaging Department is developed and implemented as a matter or urgency. The GCHHS Board Safety, Quality and Engagement Committee has already greatly enhanced and strengthened governance and oversight of radiology reporting within the GCHHS.

12. Remedial actions by GCHHS to address low radiology reporting rates

12.1 Scope

(a) Dr Herkes and Dr Sprague were asked what GCHHS has done to rectify and improve the reporting rates and whether these steps are adequate to achieve and sustain clinically acceptable rates.

(b) In particular, Dr Herkes and Dr Sprague were asked to consider the proposed actions of the Medical Imaging Reform Project to address low reporting rates and sustain a clinically acceptable reporting level, and to make recommendations about any further strategies or remedial action to address the backlog and ensure that GCHHS sustains a clinically acceptable reporting level.

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[34] Criterion 2.2.6; RANZCR Accreditation Standards for Education Training and Supervision of radiology trainees 2012. www.ranzcr.edu.au.

[35] Dr Herkes and Dr Sprague understand that the information technology system currently in use at the GCHHS is not current and that upgrades have not been implemented for some time. Representatives from the Department of Health have advised that a CERNER operating system is planned for implementation in March 2015 and will be made available to GCHHS.

[36] This option was recommended in the Sg2 external review report, however, despite carefully considering the views expressed by the GCHHS about its intention to procure its own RIS/PACS system, Dr Herkes and Dr Sprague have some reservations about the capacity of the GCHHS to support a new system and infrastructure on its own. They acknowledge the advanced nature of the GCHHS's procurement project and that, not only will it have improved reporting capacity, but will also include a work flow system (referral, appointment scheduling, waiting lists, prioritising, reporting, patient follow up etc) that is not available currently within the RIS system. Dr Herkes and Dr Sprague consider that if GCHHS does procure its own technology system, there must be a robust system of data integrity, reporting, management and accountability with rigorous system oversight. Data produced from any GCHHS developed system must be able to be produced in a way that continues to inform the overall State amalgamated picture of radiology reporting.

12.2 Remedial actions by GCHHS to address low radiology reporting rates

(a) The Diagnostic Imaging Department has recently moved to the purpose built department within the new Gold Coast University Hospital. The new department is extensive and includes interventional radiology resources in the operating suite on the second floor. There are also general x-ray rooms in the Outpatient Department on the first floor. The main Medical Imaging Department is on the lower ground floor adjacent to the Emergency Department where there is also a suite of x-ray rooms.

(b) The new Diagnostic Imaging Department has state of the art equipment and has extensive space for future expansion. The new facilities will allow the development of a cutting edge Diagnostic Imaging Department servicing the recently opened services.

(c) Following a press release from the Minister for Health and the Hospital Board which acknowledged the problems within the GCHHS Diagnostic Imaging Department the board undertook three major initiatives:

(i) to retrospectively report all plain film studies dating back to September 2013 (until which time recent steps to address low reporting rates commenced in about May 2013 had appeared to have been effective);[37]

(ii) to improve ongoing radiology reporting rates, including by outsourcing the role of reporting to third parties;

(iii) to improve governance and oversight of the Diagnostic Imaging Department.

12.3 Retrospective reporting of unreported diagnostic imaging studies

(a) It transpired that, as at June 2014, 25,365 images relating to the higher priority patient group were identified as not having had formal reports from September 2013. Of these:[38]

(i) 2,102 (8.3%) patients required further investigation and the remainder were clear;

(ii) eleven patients were identified as having a significant abnormality missed by the original clinician but current clinical information is that they have not suffered any adverse outcomes as a result. Nine patients are, however, undergoing continued monitoring and follow up;

(iii) numerous other patients were identified as having missed abnormalities but these were understood to be "clinically minor" in nature.

(b) The decision of the hospital to retrospectively report the identified higher priority patient studies is appropriate and Dr Herkes and Dr Sprague understand that the reporting is almost complete. Dr Herkes and Dr Sprague also learned that GCHHS made a subsequent decision to look back further than September 2013 to a two year timeframe for patients who had undergone higher risk imaging. That task was outsourced to a third party provider and is understood to have involved 15,390 images to report.[39] Dr Herkes and Dr Sprague consider this is also appropriate and consistent with the processes undertaken in other jurisdictions when similar issues have arisen.

(c) Dr Herkes and Dr Sprague consider that the retrospective review should detect any residual clinically significant issues which could have been detected on the unreported plain films, but have remained undiscovered. This recognises that almost all pathology

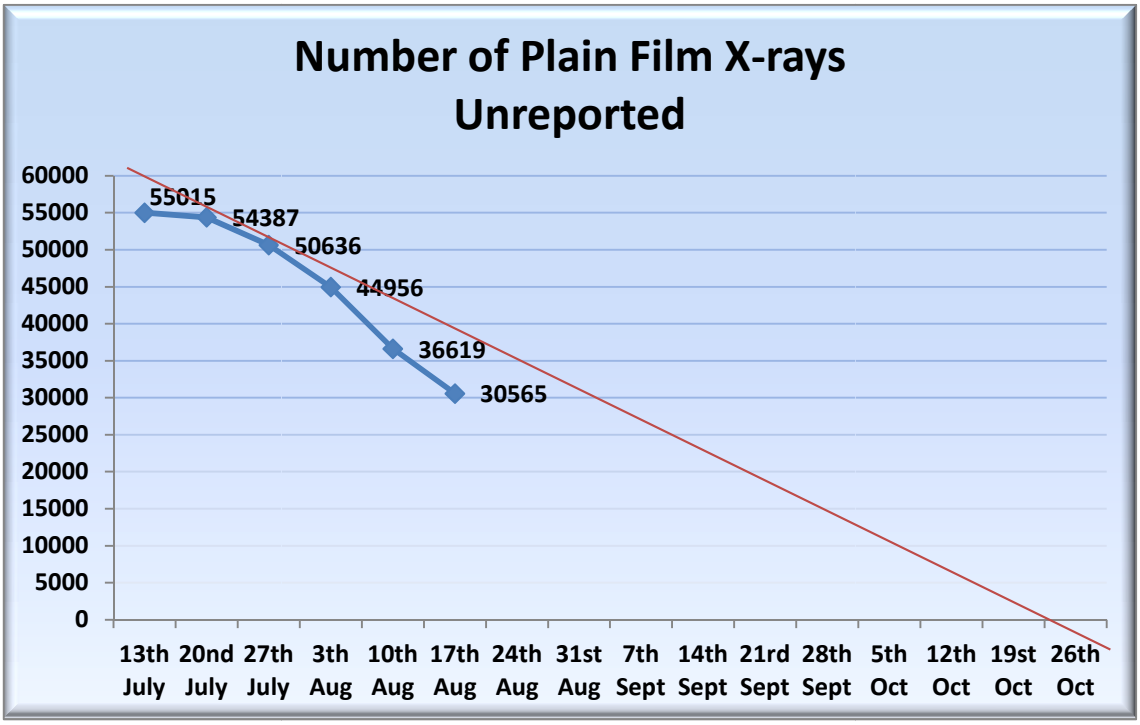
[37] According to the Gold Coast Chief Executive, early estimates were in the range of around 23,000 for the higher priority patient group.
[38] Letter from the Chief Executive to the Investigators dated 14 October 2014
[39] Letter from the Chief Executive to the Investigators dated 14 October 2014, of these 790 remain to be reported.

visible on Diagnostic Imaging Studies will ultimately cause the patient to re-present with further symptoms as their underlying disease deteriorates.

(d) Dr Herkes and Dr Sprague did, however, identify that issues still exist in relation to the appropriate medical triage of the reports to ensure that abnormal findings are relayed promptly to the patient and to their general practitioner. This medical triage needs to be completed as a matter of priority to ensure any potential missed diagnoses are appropriately treated, and to avoid further delay.

(e) The retrospective review has prioritised the reporting of emergency department and inpatient films and that is also appropriate.

Figure 3: Retrospective reporting of backlog from July to August 2014[40]



12.4 Improving the radiology reporting rate

(a) Dr Herkes and Dr Sprague were advised that, in May 2013, the Chief Executive of the GCHHS authorised the appointment of an extra radiologist and two registrars to report plain films in a specific reporting area. This was effective to some extent, at least until September 2013 which is when the hospital relocated to the new premises. The issues were further impacted with the resignation of several staff during the so-called "*contracts dispute*" in late 2013 and early 2014 and the strategy did not continue.

(b) The Board and Management of the GCHHS have, since before the onset of this investigation, determined to report all diagnostic imaging studies in a timely manner on an ongoing basis. This has been achieved by outsourcing some plain film and CT[41] reporting, as well as some MRI[42] and ultrasound studies[43] to commercial providers. At present this strategy appears to be working, although the reporting rate by the radiologists

[40] Dr Herkes and Dr Sprague acknowledge these figures may have changed since the time this data was collected.
[41] It is understood that reporting of CT scans is only outsourced between 0000 hours and 0700 hours.
[42] It is understood that MRIs required to be performed under conscious sedation are outsourced from time to time due to waiting times for MRIs under general anaesthetic at the Gold Coast University Hospital.
[43] It is understood that if an ultrasound study cannot be performed within a clinically acceptable time frame, the entire study and requirement to report is outsourced to an external provider.

employed by GCHHS remains lower than clinically acceptable. Many of the reports are still delayed and may not meet a clinically appropriate timeframe.[44]

(c) Many of the radiologists interviewed advocated the use of Relative Value Units (RVUs) to allow an appropriate equalisation of the workload within the Diagnostic Imaging Department. As noted in section 11.5(i) above, RVUs take account of the complexity of reporting a complex series of images such an as MRI, and allow a degree of balance between different reports. The feedback provided by witnesses was that the criteria for RVUs needed to be appropriately matched to the demand and resource capacity of the GCHHS Diagnostic Imaging Department.

(d) The general complacency within the hospital surrounding radiologist reported plain films also appears to have changed more recently. Staff confirmed in interviews with Dr Herkes and Dr Sprague that emergency department and ward staff are now routinely seeking out formal reports.

12.5 Improving governance and oversight

(a) The role of the GCHHS is significantly different to its regional hospital status of the past and the development of a robust modern imaging department is critical to the future of the Gold Coast University Hospital.

(b) In managing the Diagnostic Imaging Department in the future, consideration of the expanded role of the Gold Coast University Hospital as it opens new services such as trauma, cardiothoracic surgery, neurosurgery, and neonatal intensive care must all be taken into account.

(c) The GCHHS Board has an established the Safety, Quality and Engagement Committee, as a sub-committee of the Board, to oversight clinical governance.[45] It was clear to Dr Herkes and Dr Sprague that the chair of the Safety and Quality Committee has a keen understanding of the Diagnostic Imaging Reporting problems within the hospital, and is determined to rectify issues as promptly as can be achieved. These initiatives are to be encouraged.

(d) The GCHHS Board has also scheduled a comprehensive review of its risk register to be facilitated by an external consultant with a plan for the effectiveness of any new risk management governance process to be assessed by an external consultant in six months time.[46] This is appropriate and Dr Herkes and Dr Sprague support the current proposal to separate out any identified clinical risk matters from operational risk matters.

(e) The GCHHS Executive Management has also recently developed and implemented a comprehensive suite of performance reports, including for radiology reporting, to manage operational matters with a defined formal hierarchy of governance processes with Board oversight of the KPIs.[47]

(f) In addition, the GCHHS has, since June 2014:[48]

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[44] Dr Herkes and Dr Sprague acknowledge that some of these delayed reports are because the report is written, but remains in "preliminary" status within the IT system until it is formally "validated " by the radiologist

[45] The Safety, Quality and Engagement Committee was established by the Board in 2011 in accordance with the *Hospital and Health Boards Act (Qld) 2011*

[46] The investigators were informed that the facilitated risk review has been scheduled for 23 October 2014 and is to be attended by representatives from the Board, General Managers and Clinical Directors.

[47] Letter Chief Executive to Investigators dated 14 October 2014.

[48] Letter Chief Executive to Investigators dated 14 October 2014; Letter HSQ to Investigators dated 17 October 2014 emphasises HSQ's role in assisting the GCHHS to develop these improvements.

(i) developed a suite of reports showing reporting rates capable of distinguishing the source of the request (emergency department, inpatient, outpatient);

(ii) automated the flow of data associated with those reports to produce daily and weekly reports automatically from the server;

(iii) built a web-based module with individual log in for all diagnostic imaging senior staff enabling them to review data (by source of request and modality) at their desktops;

(iv) developed a framework to prioritise time frames for reporting based on the source of the request which is currently being agreed with the various referring teams.

(g) It is expected that these reporting developments will also enable an assessment of the reporting rates and times by individual radiologists.

(h) Recent management initiatives, especially those being implemented by the executive of the Diagnostic Imaging, Emergency and Medical Services Departments appear to be gaining traction and the move to map workflow, rewrite job descriptions and develop performance reporting in association with the Centre for Health Innovation at Griffith University and the CGHHS's People, Systems and Performance group is to be applauded.

12.6 Are the remedial actions by GCHHS adequate to achieve and sustain clinically acceptable rates?

(a) The remedial actions by GCHHS to address the backlog and put in place systems and processes to ensure there are clinically acceptable reporting rates in the future are commendable and appear to have been effective in the short-term.

(b) Dr Herkes and Dr Sprague are, however, concerned about the number of potential barriers that, if not rectified may impede the ability of the GCHHS to sustain clinically acceptable radiology reporting rates in the long term.[49]

(c) Further, Dr Herkes and Dr Sprague have concerns about any model of radiology reporting that includes a significant competent of outsourcing to third party providers. They consider that outsourcing of diagnostic imaging reporting raises a number of issues, in particular:

(i) the reporting radiologist is unknown to the requesting clinician and therefore oversight of the request and handover of an abnormal result may be more difficult;

(ii) the reporting radiologist may not have readily available access to relevant prior imaging for the patient;

(iii) outsourcing raises the additional concern of potential and unacceptable conflicts of interest and perverse incentives, which may arise from GCHHS employed radiologists working for private providers reporting studies that they fail to report in their public role.

(d) Dr Herkes and Dr Sprague are therefore concerned about the recent high percentage of plain films that are being reported externally.

[49] These barriers are discussed under section 11, Part A, above

Figure 4: Comparison of in-house and outsourced reporting rates at GCHHS[50]

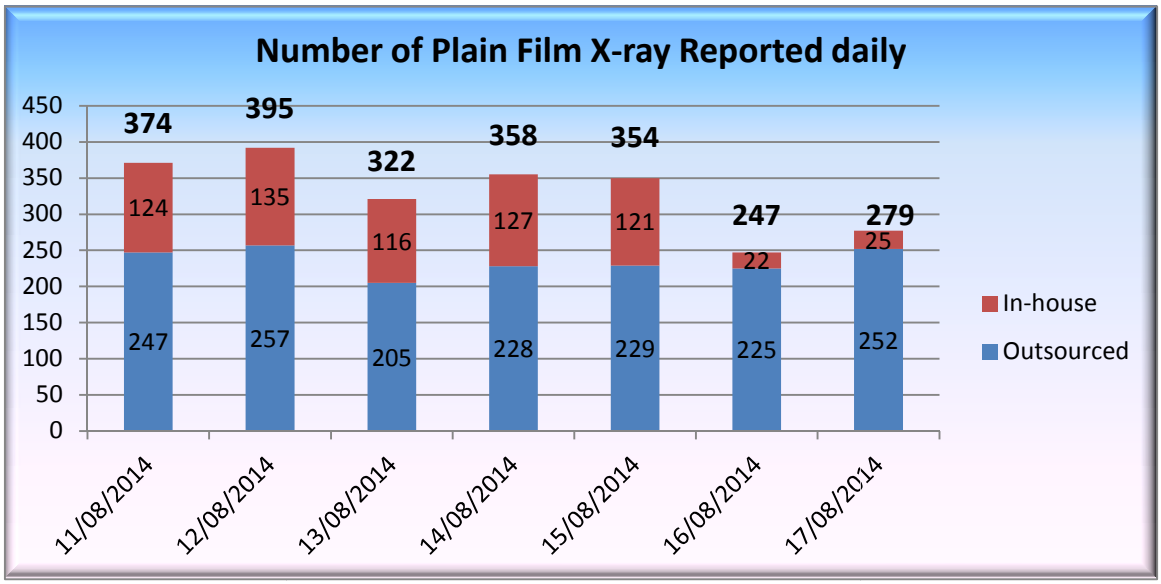
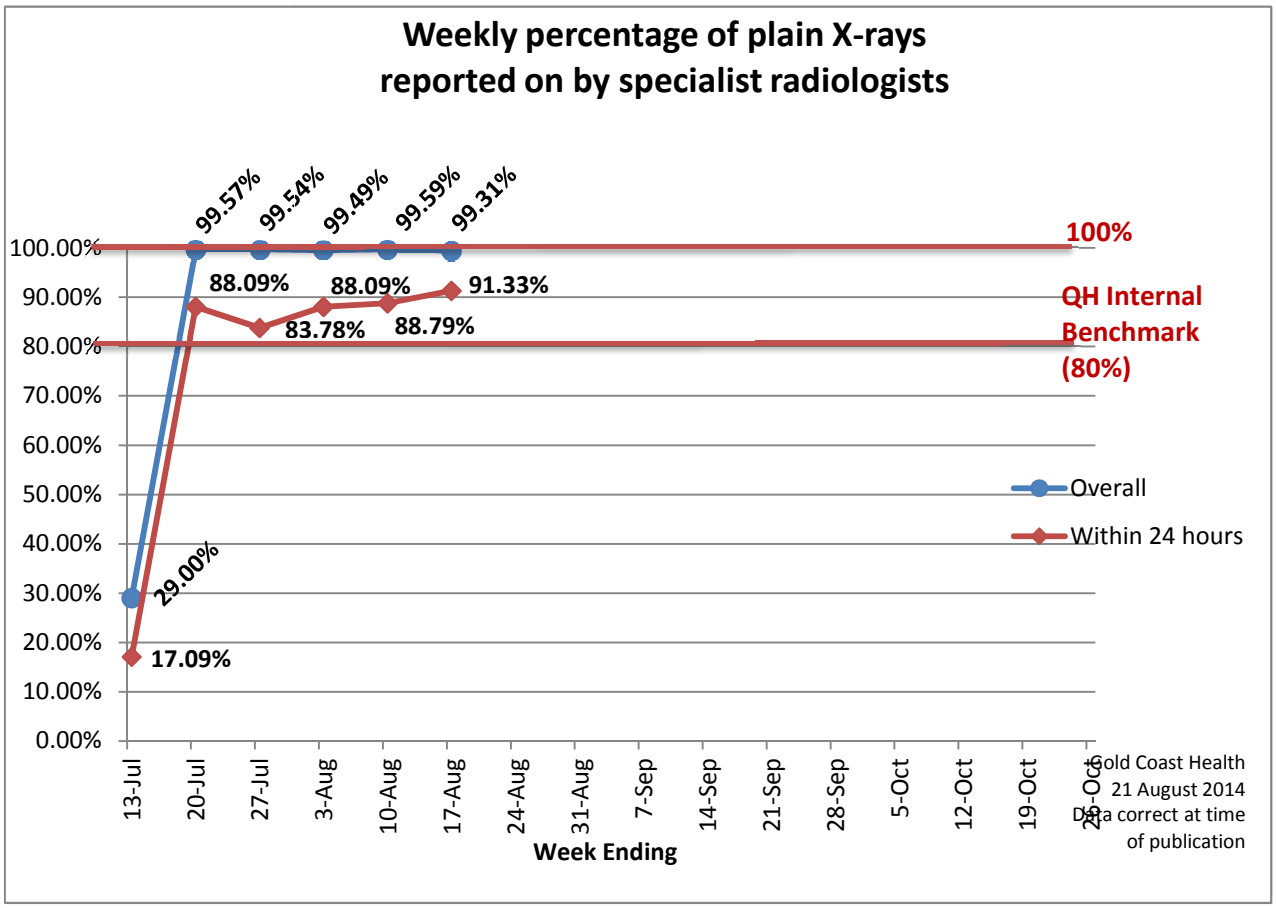


Figure 5: GCHHS in-house consultant reporting rates since July 2014[51]



[50] Dr Herkes and Dr Sprague acknowledge these figures may have changed since the time this data was collected in August 2014.

[51] Data for other Diagnostic Imaging studies such as CT, MRI and ultrasound was not available to Dr Herkes and Dr Sprague and that is an issue that needs to be monitored. Dr Herkes and Dr Sprague acknowledge these figures may have changed since the time this data was collected in August 2014.

(e) The ideal Diagnostic Imaging Department would undertake all in hours reporting in-house and this should be the case at GCHHS.

(f) Dr Herkes and Dr Sprague consider that, if GCHHS were able to achieve clinically acceptable radiology reporting rates as outlined for a tertiary facility under heading 10.2 above, there would be no backlog and probably no need for long-term outsourcing.

(g) This would allow the further development of a leading Australian diagnostic imaging facility within the GCHHS and more particularly the Gold Coast University Hospital.

(h) Dr Herkes and Dr Sprague also consider it is critical for the operational structure of the organisation to include an appropriate level of clinical reports to the Chief Executive. The current operational structure of the GCHHS includes an Executive Director Clinical Governance Education and Research and this position is currently filled by a clinician. However the managers of the clinical departments report to the Executive Director of Operations. Dr Herkes and Dr Sprague are concerned that this may not enable enough breadth of clinical representation at the senior executive level. That said, it is understood that regular meetings are held which are attended by the Chief Executive and the managers of the clinical departments.

12.7 Summary findings

(a) In relation to the remedial actions by GCHHS to address low reporting rates, Dr Herkes and Dr Sprague formed the view that:

(i) The retrospective review, improved reporting rates and improved governance measures are appropriate and if sustained will serve the patients of the GCHHS well.

(b) In relation to whether these steps are adequate to achieve and sustain clinically acceptable rates, Dr Herkes and Dr Sprague formed the view that:

(i) In-house radiology reporting should be encouraged and facilitated to the greatest extent possible. The ability for on site radiologists to form an ongoing relationship with other hospital clinicians greatly enhances the functioning of the hospital. This relationship includes education of hospital clinicians, shared case meetings, request triage and notification of abnormal results.

(ii) Wherever possible the disadvantages of outsourcing radiology reporting should be avoided.

(iii) The recent interest from the GCHHS Board and its Safety, Quality and Clinical Engagement Committee is appropriate and should continue. The Board and its Safety, Quality and Clinical Engagement Committee needs to be provided with ongoing reports of the progress of the backlog, and should take a primary role in ensuring that there is no recurrence of underreporting.

(c) In relation to whether the proposed actions of the Medical Imaging Reform Project are adequate to address the backlog and ensure that GCHHS sustains a clinically acceptable reporting level, Dr Herkes and Dr Sprague formed the view that:

(i) continued monitoring such as is evident in the period from July needs to be reported to the Director of the Diagnostic Imaging Department and the GCHHS CE to ensure that the backlog is cleared. Special attention needs to be paid to the clinical triage of abnormal results to feedback to the patients and their general practitioner;

(ii) weekly reports detailing the reporting rate by modality need to be provided in an ongoing manner;

(iii) the current management initiatives if sustained should ensure that the underreporting of images does not recur.

12.8 Recommendations

(a) In relation to the remedial actions by GCHHS to address low reporting rates, Dr Herkes and Dr Sprague recommend that:

(i) It is the belief of Dr Herkes and Dr Sprague that the culture within the Diagnostic Imaging Department needs to change such that all investigations are reported in-house and that everyone employed in the GCHHS is responsible for achieving this.

(A) Dr Herkes and Dr Sprague are aware that in some centres this issue is addressed by ensuring that radiologists do not leave the facility until all daytime reports have been completed.

(B) This may involve scheduling two to three hours general reporting for each radiologist per day.

(ii) Robust ongoing reporting and KPIs to be implemented in order to track report completion and these to be provided to the Director of the Diagnostic Imaging Department on a weekly basis and reported quarterly to the Safety and Quality Committee of the Board.

(iii) The clinical managers of the Diagnostic Imaging Department should also be required to undertake focussed training in business management, preferably in relation to management of a health workforce.

(b) In relation to achieving and sustaining clinically acceptable rates, Dr Herkes and Dr Sprague recommend that:

(i) The Clinical Governance Committee should escalate any failure to meet quarterly KPIs to the Safety, Quality and Clinical Engagement Committee of the Board with a plan for rectification;

(ii) A failure to meet KPIs for two or more consecutive quarters, or for two out of four quarters within a given reporting year, should be reported by the Board Chair to the Director General of Health and the Minister of Health with a plan for rectification.

(c) In relation to whether the proposed actions of the Medical Imaging Reform Project adequate to address the backlog and ensure that GCHHS sustains a clinically acceptable reporting level, Dr Herkes and Dr Sprague recommend that:

(i) the retrospective review should be completed in a timely fashion and should be complete by the end of October 2014;

(ii) the senior clinical triage of abnormal findings to ensure that abnormal results should be relayed to the patient and their general practitioner by the end of October 2014;[52]

[52] The GCHHS Board Chair and Chief Executive are aware of this proposed time frame and have advised that they agree it is appropriate and have already taken steps to ensure it is met.

(iii) the retrospective review should be transparent and GCHHS should publish the rate of undiscovered abnormalities on plain film studies in order further the understanding of the risks to patients of unreported plain studies;

(iv) new management reporting at GCHHS needs to monitor ongoing reporting of all diagnostic imaging modalities to ensure that there is no future recurrence of under-reporting rates of radiology in the GCHHS.

END OF PART A

Part B – Assessment of radiology reporting rates at other Hospital and Health Services

13. Desktop review of data held by Queensland Health reported rates for radiology to determine if any other Hospital and Health Services reported below the clinically acceptable reporting level for the period 1 July 2011 to 30 June 2014

13.1 Scope

(a) Dr Herkes and Dr Sprague were asked to undertake a desktop review of reported rates for radiology by all Hospital and Health Services from data held by Queensland Health to identify if other Hospital and Health services were reporting rates below a clinically acceptable level in the period for the period 1 July 2011 to 30 June 2014.

13.2 Desktop review of radiology reporting rates by other Hospital and Health Services for the period 1 July 2011 to 30 June 2014 from data held by Queensland Health

(a) Dr Herkes and Dr Sprague reviewed data supplied by Health Support Queensland (HSQ) of the reporting rates and timeliness for the Diagnostic Imaging Departments of each of the Queensland HHSs.[53]

(b) The desktop data review focussed on whether any other HHSs had lower than acceptable reporting levels for radiology by reference to the clinically acceptable range outlined by Dr Herkes and Dr Sprague in section 10.2 above.

13.3 Identification of other Hospital and Health Services that had lower than clinically acceptable radiology reporting rates in the defined period

(a) Statewide data suggests that most of the 16 Hospital and Health Services are achieving a reporting rate within the clinically acceptable range.

(b) Of the six HHSs which can be described as larger services, (that is, with 100,000 studies or more annually), only GCHHS had unacceptable reporting rates. The others have consistently achieved over 90% reporting rates since 2012 (refer Table 2 below).

Table 2: Radiology reporting rates in HHSs with over 100,000 studies per year

HHS	2012-13	Reporting Rate	2013-14	Reporting Rate
Cairns and Hinterland	113,398	100%	116,123	100%
Metro North	428,675	96%	423,770	96%
Metro South	384,489	97%	391,118	96%
Sunshine Coast	121,937	93%	128,239	94%
Townsville	113,243	93%	126,373	97.5%

[53] Dr Herkes and Dr Sprague acknowledge that, in accordance with the terms of reference for Part B of this investigation, they did not taken any steps to verify the integrity of the data provided to them by HSQ. Dr Herkes and Dr Sprague accept that there are likely to be some flaws in the data provided, however, they do not consider this has any impact at all on their ability to make findings and recommendations for the limited and defined purposes of this Part B.

HHS	2012-13	Reporting Rate	2013-14	Reporting Rate
Gold Coast	165,671	46%	178,519	68%

(c) It is noteworthy that remote HHSs such as Cape York HHS and Torres Straight/ Northern Peninsula HSS appear to have achieved acceptable reporting rates in the relevant period.

(d) Apart from the Gold Coast HHS, with a 2012 to 2013 reporting rate of 46%, the other HHSs with significant numbers of unreported studies were all significantly smaller regional services - Central Queensland (81% reported), Darling Downs (78% reported) and West Morton (79% reported).

(e) In 2012 to 2013 only five HHS Diagnostic Imaging Services were able report over 80% of studies within 24 hours (Cairns and Hinterland, Metro South, North West, Sunshine Coast and West Morton). The remaining 12 HHSs did not meet this criterion.

(f) The more recent 2013 to 2014 data shows there has been general improvement with Central Queensland and Wide Bay now performing well, but the Gold Coast still remains an outlier (refer Table 3 below).

Table 3: 2013 to 2014 Diagnostic Imaging Reporting

HHS	Reported Internally	Reported Externally	Unreported	Total studies	Reported %
Gold Coast	98,869	19,129	60,521	178,519	68%
Central Queensland	16,630	58,905	6,507	82,507	92%
Darling Downs	61,396	13,309	19,216	93,921	80%
Wide Bay	7,646	77,831	4,892	90,369	94%
West Moreton	n/a	n/a	11,608	78,055	85%

(g) To ensure good patient care and good use of resources, it is essential that the Diagnostic Imaging Department is appropriately resourced with adequate staff including medical, technical, office/secretarial and nursing to focus on what is good for patients.

(h) As stated, the Royal Australian and New Zealand College of Radiologists indicate a work load rate of 10,000 per FTE radiologist per annum. This is utilised in many hospital departments across the country.

(i) Projects looking at radiology capacity have been undertaken in conjunction with the RANZCR, and there is ongoing work seeking to progress the development of RVUs; that is, a robust, and transparent method of measuring overall work load, and predicting work capacity of radiologists in different settings taking into account the range of modalities including complex CT, MRI and PET-CT as an example.

(j) Dr Herkes and Dr Sprague are aware of hospital departments who have developed their own RVUs whilst this work is being finalised.[54]

[54] See 11.5(j) above.

13.4 Policy, procedure and practice review of the Hospital and Health Services that had lower than clinically acceptable radiology reporting rates in the defined period

(a) Current national standards from the Royal Australian and New Zealand College of Radiologists (RANZCR) expect that every diagnostic image ordered is reported upon by a qualified radiologist in a timely fashion.[55]

(b) Darling Downs HHS and West Moreton HHS are the only services which were identified as having a technically lower than clinically acceptable reporting rate for some of the period under review. That said, both HHSs were only slightly under the rate adopted by Dr Herkes and Dr Sprague for the purposes of this report in the period 2012 to 2013, at respectively, 78% and 79%. Both HHSs improved in the most recent 2013 to 2014 reporting year to, respectively, 80% and 85%.

(c) Dr Herkes and Dr Sprague were not advised of any prescriptive guideline or procedure that had been adopted in Darling Downs HHS.

(d) West Moreton HHS did however provide a copy of its local procedure. Dr Sprague and Dr Herkes were impressed with that procedure overall, although they do not consider the time frames are consistent with their views set out in sections 2.2 above and 10.2 above.

13.5 Reasons identified for other Hospital and Health Services that had lower than clinically acceptable radiology reporting rates in the defined period

(a) In relation to Darling Downs HHS:

(i) It should be reiterated that Darling Downs HHS had slightly below or at the borderline of the clinically acceptable reporting rate of 80% as adopted by Dr Herkes and Dr Sprague for the purposes of this investigation.

(ii) The Chief Executive of the Darling Downs HHS noted the following issues impacting on reporting rates:[56]

(A) the DDHHS has been using the RIS/PAC system for all of its health facilities since 1 July 2011;

(B) all radiology reporting for the HHS, which comprises regional and rural health services, is undertaken at Toowoomba Hospital (with CT services being introduced shortly in Goondiwindi and Warwick);

(C) since that time, there have been several issues with attracting and retaining staff specialist radiologists (including positions advertised and not able to be filled with a suitable candidate);

(D) in September 2014, a third party provider was engaged with a view to address any gap in reporting not able to be achieved by employed radiology staff as well as to assist with any current backlog in reporting on a progressive basis (with CT reporting to remain inhouse);

(E) the expectation for reporting in the outsourcing agreement is stated as next business day (which Dr Herkes and Dr Sprague consider is appropriate in a HHS that comprises regional and rural health facilities).

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[55] RANZCR Standards of Practice for Diagnostic and Interventional Radiology V 9.2 Section 5-5-3 Communication of Imaging Findings and Reports accessed online at http://ranzcr.edu.au/component/docman/doc_download/510-ranzcr-standards-of-practice-for-diagnostic-and-interventional-radiology

[56] Letter Chief Executive Darling Downs HHS to Investigators dated 15 October 2014

(iii) DDHHS demonstrated that it issued work instructions on three occasions during the period under investigation to establish radiology reporting priorities for its radiology staff.

13.6 Strategies that could be implemented to achieve and sustain a clinically acceptable level at the other Hospital and Health Services that had lower than clinically acceptable radiology reporting rates in the defined period

(a) Dr Herkes and Dr Sprague did not find that any other HHS had a sustained lower than clinically acceptable reporting rate. The two identified HHSs with a slightly lower rate in the 2012 to 2013 reporting period, both had an acceptable rate in the preceding and more recent 2013 to 2014 reporting period.

(b) Dr Herkes and Dr Sprague consider it is appropriate to approach this section of the report to highlight strategies that are being used in other HHSs that could inform GCHHS in developing its own strategies in addition to those outlined in section 12 above.

(c) Although the Queensland Health Guideline for the Provision of Diagnostic Imaging reports as outlined in section 10.3(b) above applies to all HHSs, Dr Herkes and Dr Sprague became aware that, like GCHHS, very few HHSs had developed prescriptive guidelines and benchmarks applicable to their respective settings.

(d) The only HHS which produced a locally developed procedure was West Moreton as noted in section 13.4(d) above. Dr Herkes and Dr Sprague would endorse this procedure and would encourage every HHS to adopt and implement it locally, albeit amended to reflect the time frames advocated in this report. If such a procedure was adhered to, there should be no HHS, including at GCHHS, with lower than clinically acceptable reporting rates in Queensland.

(e) Sunshine Coast HHS, which has had consistently acceptable reporting rates throughout the period under investigation, has advised about its internal standards, which are now audited on a monthly basis, that set the following expectations:[57]

(i) cross sectional imaging (CT and MR) and emergency department patients to be reported on the same day;

(ii) inpatient imaging to be conducted on the day the request is received and reported as a priority.

(f) Sunshine Coast HHS also advised it has a robust risk management system designed to proactively highlight concerns that could impact on its ability to meet clinical service benchmarks and standards.[58]

(g) Some HHSs[59] advised that they had ensured their third party agreements for any outsourced radiology reporting required from time to time had built in KPIs to the contracts. Dr Herkes and Dr Sprague encourage all HHSs, when outsourcing the task of radiology reporting, to ensure they clearly establish in contractual documents appropriate KPI expectations consistent with those recommended in sections 2.2 and 10.2 above.

13.7 Summary of findings

(a) In relation to the desktop review of radiology reporting rates by other Hospital and Health Services for the period 1 July 2011 to 30 June 2014 from data held by Queensland Health, Dr Herkes and Dr Sprague formed the view that:

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[57] Letter Chief Executive SCHHS to Investigators dated 15 October 2014
[58] Ibid.
[59] For example, Wide Bay HHS, North West HHS, South West HHS, Darling Downs HHS

(i) most of the 17 HHSs are achieving a reporting rate within the clinically acceptable range;

(ii) of the five larger HHSs (that is, excluding GCHHS), all have consistently achieved over 90% reporting rates within 24 hours since 2012;

(iii) remote HHSs such as Torres and Cape HHS appear to have achieved acceptable reporting rates during the relevant period.

(b) In relation to identification of other Hospital and Health Services that had lower than clinically acceptable radiology reporting rates, Dr Herkes and Dr Sprague found that:

(i) Darling Downs HHS and West Moreton HHS are the only services which were identified as having a technically lower than clinically acceptable reporting rate for some of the period under review.

(ii) That said, both HHSs were only slightly under the rate adopted by Dr Herkes and Dr Sprague for the purposes of this report in the period 2012 to 2013, at respectively, 78% and 79%. Both HHSs improved in the most recent 2013 to 2014 reporting year to, respectively, 80% and 85%

(c) In relation to policy, procedure and practice review of those Hospital and Health Services that had lower than clinically acceptable radiology reporting rates, Dr Herkes and Dr Sprague formed the view that:

(i) while Darling Downs HHS had issued work instructions from time to time it has not developed prescriptive guidelines and benchmarks applicable to its respective settings.

(d) In relation to the reasons identified for the other Hospital and Health Services that had lower than clinically acceptable radiology reporting rates, Dr Herkes and Dr Sprague formed the view that:

(i) Darling Downs explained some difficulties with attracting and recruiting specialist radiology staff, however, it needs to be reiterated that this HHS was not found to have had a sustained or ongoing lower than acceptable reporting rate and in the most recent reporting period, it had an acceptable rate.

(e) In relation to strategies that could be implemented to achieve and sustain a clinically acceptable level at the other Hospital and Health Services, Dr Herkes and Dr Sprague formed the view that:

(i) very few HHSs had developed prescriptive guidelines and benchmarks applicable to their respective settings;

(ii) West Moreton has a local procedure which Dr Herkes and Dr Sprague have recommended be adopted and implemented at every HHS;

(iii) Sunshine Coast HHS also reported it had established internal standards for clinical reporting which are now audited on a monthly basis

(iv) Some HHSs advised that they had ensured their third party agreements for any outsourced radiology reporting required from time to time had built in KPIs to the contracts.

13.8 Recommendations to achieve and sustain clinically acceptable radiology reporting rates at other Hospital and Health Services

(a) In relation to the strategies that could be implemented to achieve and sustain a clinically acceptable level at other Hospital and Health Services that have lower than clinically acceptable radiology reporting rates, Dr Herkes and Dr Sprague recommend:

(i) all HHSs to adopt and implement a procedure consistent with that in use at West Moreton HHS, albeit amended to reflect the time frames advocated in this report;

(ii) all HHSs, when outsourcing the task of radiology reporting, to ensure they clearly establish in contractual documents appropriate KPI expectations consistent with those recommended in sections 2.2 and 10.2 above.

END OF PART B

Part C – Assess the governance of radiology reporting rates by Health Support Queensland

14. Governance processes for Health Support Queensland and performance management of HHSs in relation to radiology reporting rates and medical imaging.

14.1 Scope

(a) Dr Herkes and Dr Sprague were asked to review the governance processes for Health Support Queensland (**HSQ**) and assess how this group identifies, escalates and manages a deterioration in radiology reporting rates and medical imaging data as a performance issue for a particular HHS.

14.2 The governance processes for HSQ to identify, escalate and manage a deterioration in HHS performance in relation to radiology reporting rates and medical imaging.

(a) During the recent reorganisation of Queensland Health and the devolution of financial, administrative and governance responsibility to the Boards of the 16 Hospital and Health Services, HSQ retained the responsibility for oversight of contestability, procurement and logistics, diagnostic and scientific services, health technology and clinical support services.

(b) Radiology support remains within the clinical support services and has responsibility for supporting and oversight of the delivery of safe, sustainable and appropriate diagnostic imaging throughout the state. This includes advice on training and support to ensure compliance with external standards and audits. Annual reports are generated to demonstrate hospital activity, reporting rates and timeliness overall and by imaging modality (CT, MRI, plain film etc). These reports are provided to the Diagnostic Imaging Departments, HHS Boards and the Director General of the Department of Health.

(c) The reports produced by HSQ are, by and large, compiled from data extracted from various RIS systems in use across the State. HSQ has acknowledged that the different systems do not currently measure radiology examination data and time stamps in a consistent manner.[60] A number of witnesses interviewed for the Part A and Part B aspects of this investigation did raise concerns to Dr Herkes and Dr Sprague about the integrity of the data, consistency of definitions and the validity of comparing data and reports as between HHSs. The terms of reference do not envisage that Dr Herkes and Dr Sprague would investigate this issue further, however, they agree there needs to be clearly defined data definitions, collection criteria and integrity processes to ensure confidence in the oversight system and reports produced.

(d) During interviews with staff from HSQ and Radiology Support, it became clear that there was significant concern about the new governance structures and the ability of HSQ to effectively influence the delivery of safe and effective care for patients undergoing diagnostic imaging studies. The staff remained enthusiastic that Radiology Support was performing an essential service to diagnostic imaging services across the state and that there was considerable value delivered by having an overview of the whole state.

(e) HSQ has a clinical oversight committee, Queensland Health Imaging Program (QHIP), which advises on policy, guidelines and planning. This group has recently been very

[60] Letter HSQ to Investigators 17 October 2014

active, having commissioned and helped to develop the Queensland Health Statewide diagnostic imaging strategy, in association with Sg2, and the subsequent Diagnostic Imaging Strategy 2103 to 2017.

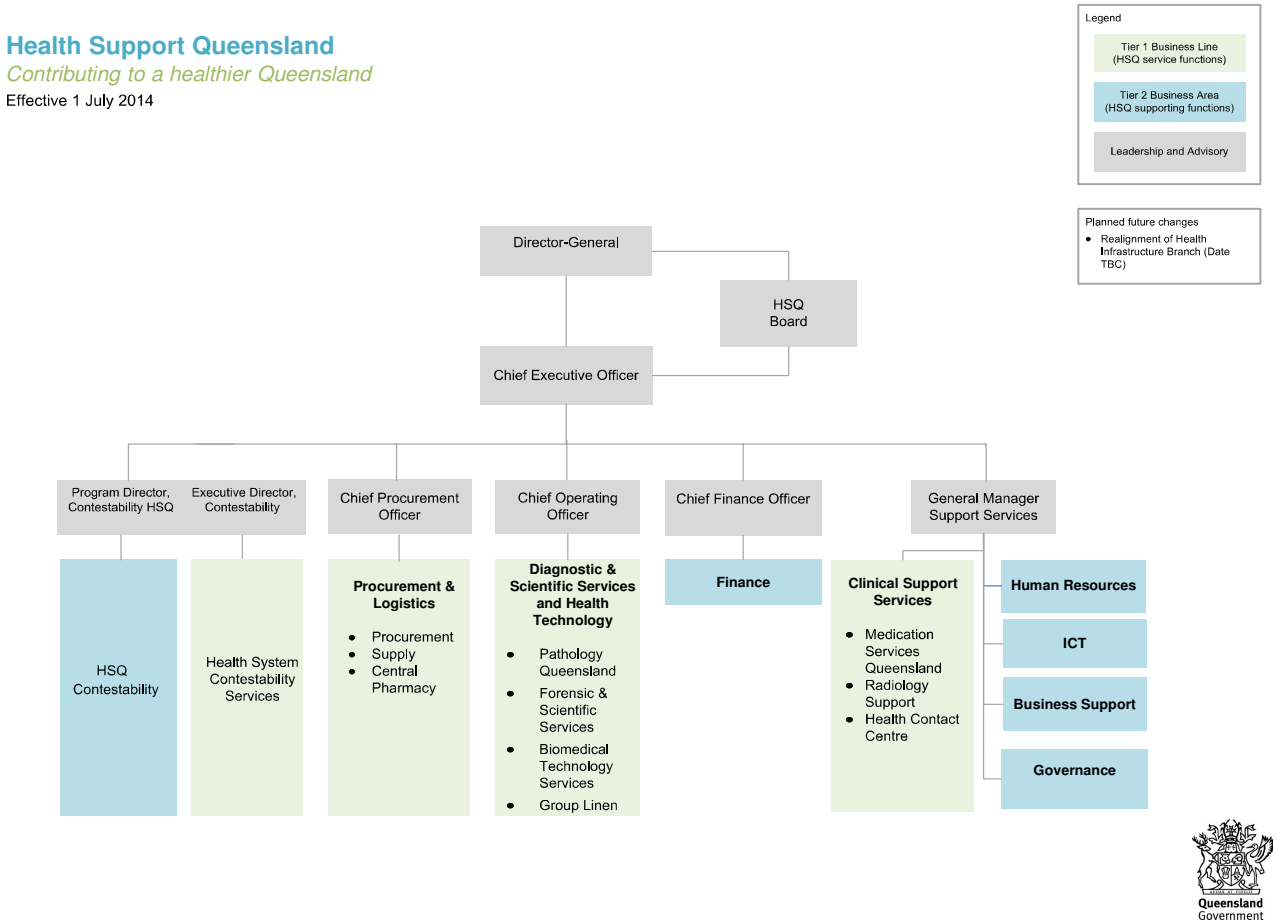
(f) Senior members of the QHIP Committee did, however, express the view that the Committee was not engaged within the new governance structure with a devolved health system and, despite excellent plans, had been unable to obtain an executive sponsor to advance the Sg2 or the Strategic Plans.

(g) Radiology Informatics Support Unit is also located within HSQ. This unit hosts and maintains the Queensland Radiology Information System (QRIS), used in 96 facilities across the state as well as the Enterprise Picture Archive Communication System (PACS), used in 63 facilities. This unit is responsible to maintain statewide services and would host future state-wide infrastructure. Technicians from this unit have supplied technical assistance to GCHHS and have attempted to improve the functionality of the RIS at GCHHS.

14.3 Effective arrangements which could be implemented statewide to ensure reporting levels are sustained a clinically acceptable level

(a) While Health Support Queensland monitors diagnostic imaging across the State and reports on an annual basis, it was the impression of Dr Herkes and Dr Sprague, that with devolution, Health Support Queensland believed that it had no effective ongoing clinical governance function. The view was strongly expressed that HSQ had limited power to escalate clinical issues when concerns arose.

Figure 6: Organisational chart for Health Support Queensland



14.4 Summary of findings in relation to Health Support Queensland

(a) In relation to the governance processes for HSQ to identify, escalate and manage a deterioration in HHS performance in relation to radiology reporting rates and medical imaging data, Dr Herkes and Dr Sprague formed the view that:

(i) HSQ monitors diagnostic imaging across the state and reports annually about this to the local HHSs and to Queensland Health. It appears that since the devolution of health services away from a centralised system, HSQ , while recognising the need for robust comparative reporting of Diagnostic Imaging Departments throughput across Queensland, has not appreciated the methods that could be used to fulfil an ongoing clinical governance function.

(ii) The Radiology Support Group has not used the HSQ and HHS Boards to highlight and escalate underperformance or other clinical issues when concerns arise, both within and outside of the annual reporting function.

14.5 Recommendations relating to Health Support Queensland

(a) In relation to the effective arrangements which could be implemented statewide to ensure reporting levels are sustained a clinically acceptable level, Dr Herkes and Dr Sprague recommend:

(i) The advantage of having central oversight of the performance of HHSs for key priority areas cannot be underestimated. Diagnostic imaging has become a major driver of improving patient outcomes and decreasing patient morbidity. Regardless of the ultimate configuration and governance of Diagnostic Imaging Departments within HHSs, it is vital that standardised public reporting is available for all public diagnostic imaging services across Queensland.

(ii) To improve the rate of radiology study reporting across the State, HSQ continue to evolve consistent definitions to allow the collection of standardised data across Queensland and to allow comparative reporting to be published. Due to the different RISs in use within Queensland it would be easiest for data to be collected at the HHS level and collated statewide by HSQ. HSQ to develop standard business reports to be completed on a weekly basis by the Diagnostic Imaging Department of each HHS. These reports should include metrics defined by HSQ for studies performed, reporting rates, timeliness, wait times, radiologist work loads by DI Modality (plain, CT, MRI, angio, ultrasound etc).

(iii) Quarterly reports of performance including peer comparisons need to be sent to each HHS Board in relation to individual facilities. If reporting rates fall below the clinically acceptable range, having notified the relevant Diagnostic Imaging Department and the HHS Board, HSQ should seek advice from its Board and QHIP committee prior to escalating notification to the Director General of the Department of Health and/or the Minister of Health for appropriate intervention at the Board Chair level.[61]

(iv) In the medium term, reports on the functioning of all Diagnostic Imaging Departments, including reporting rates and timeliness of each modality, should be made identifiable, publicly available and promulgated. As a first step, these reports should be interpreted by the QHIP clinical group and published by peer group

[61] HSQ has advised they have commenced developing a governance protocol to monitor radiology reporting performance which includes an escalation process to the Director General as well as the HHS Board for a major non-conformance: Letter HSQ to Investigators 17 October 2014.

without identifiers. Ultimately public reporting and transparency of performance, particularly as the health system embraces contestability, is vital.

(v) Where an HHS installs its own RIS/PACS these standardised reports should be mandated from the HHS system and reported against peers to the public.

(vi) As custodian of QRiS, HSQ needs to develop an extensive suite of business reports to include radiologist level work pattern and output to allow modern management of the Diagnostic Imaging Departments.[62]

(vii) HSQ should also specify the desired functionality and, if possible, introduce an electronic order entry system with sophisticated request support, waiting list management and order prioritisation, for implementation across the State. This would allow much better understanding and transparency of waiting times and demand across all public diagnostic imaging services.

(viii) The recommendations in the Sg2 Report and the Diagnostic Imaging Strategy 2013 to 2017 are sound and would significantly improve diagnostic imaging practices across the State. A senior sponsor within one of the HHSs should be given carriage of the report recommendations, with a brief to adapt it to the new devolved environment and then commence implementation.

(ix) To meet this objective, the following steps should be implemented as a matter of priority:[63]

(F) the Imaging Strategy 2013 to 2017 should be endorsed by the senior management team (SMT) of the Department of Health;

(G) the Imaging Strategy 2013 to 2017 should be presented to the Chief Executives and Chairs of the 16 HHSs;

(H) a business case should be developed to identify the responsibilities of the whole of State versus the responsibilities of the HHSs in order to provide a mechanism to determine the investment requirements at a whole of State level;

(I) a small business unit preferably based in HSQ should be identified, including a project manager, to oversee the development and management of the business case for the implementation of the Imaging Strategic Plan 2013-2017;

(J) the Clinical Radiology Group should continue to be supported by Qld Health Imaging Program (QHIP) with enhanced responsibility to monitor data for audit and feedback for the HHS CEs, Boards and Minister.

(x) Transparency and accountability must be implemented across the system, including to ensure there are clear and consistently applied data definitions, collection criteria and data integrity processes.

END OF PART C

[62] HSQ has been working with QRiS to expand business reporting capability: Letter HSQ to Investigators 17 October 2014.
[63] Dr Herkes and Dr Sprague appreciate HSQ's priority support for these recommendations: Letter HSQ to Investigators 17 October 2014.