The Regulation and Quality Improvement Authority

Independent Review of the Reporting Arrangements for Radiological Investigations

Phase 2 Report

December 2011

informing and improving health and social care
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Contents

Executive Summary

On 15 February 2011, Mr. Michael McGimpsey, MLA, Minister for Health, Social Services and Public Safety commissioned RQIA to review the handling and reporting of radiological requests in all Health and Social Care (HSC) Trusts in Northern Ireland. This review was to be completed in two phases.

The request for the review followed delays in the reporting of plain x-ray radiological examinations at Altnagelvin Hospital, Londonderry (Western Health and Social Care Trust) and Craigavon Hospital, Craigavon (Southern Health and Social Care Trust).

Phase 1 of the review focused on the systems in place for the handling and reporting on plain x-rays across the five HSC trusts. An overview report and five individual trust reports on the findings of Phase 1 were published on RQIA's website (www.rqia.org.uk) on 31 August 2011.

The focus of Phase 2 of the review was to examine the circumstances leading to any significant delays in the handling and reporting of plain x rays in the previous two years, and how those delays were managed.

From the evidence considered during Phase 1, the review team concluded that Phase 2 should focus on delays in the reporting of plain film x-rays which had occurred in the Southern Health and Social Care Trust and the Western Health and Social Care Trust.

On 29 June 2011, the Minister for Health, Social Services and Public Safety, Mr Edwin Poots, MLA, gave approval to commence Phase 2 of the review.

The terms of reference for Phase 2 of the review were:

1. To describe the circumstances leading to the significant delays in the handling and reporting of radiological investigations in the last two years in the Southern and Western Trusts and how these delays have been managed by both trusts and the Health and Social Care Board (HSC Board);

2. To identify any factors which contributed to delays in handling and reporting radiological investigations, in the two trusts, during the past two years and make both generic and specific recommendations for the trusts involved, and, if appropriate, for other HSC organisations;

3. To consider the impact of identified delays to service users;

4. To examine any other relevant matters emerging during the course of the review.

RQIA submitted this report to the Minister for Health, Social Services and Public Safety on 15 December 2011.

Circumstances Leading to Delays in the Southern Trust

The review team has concluded that the three main factors contributing to delays in reporting plain x-rays in the Southern Trust during 2010 and up to March 2011, were: a shortfall in consultant radiology staffing, a growth in numbers of x-rays to be reported after the introduction of the Northern Ireland Picture Archiving and Communication System (NIPACS) and the introduction of a new policy to report on all hospital chest x-rays in response to concerns about patient safety. The number of x-rays to be reported, following the allocation of funding for elective care late in the 2010-11 financial year, increased the size of the backlog.

Circumstances leading to Delays in the Western Trust

The review team has concluded that the most important factor leading to delays in reporting of plain x-rays at Altnagelvin Hospital in the Western Trust from mid-2008 to October 2010 was a major shortfall in consultant radiologists, due to unfilled funded posts. Other important contributing factors were increased numbers of x-rays for reporting following the introduction of NIPACS: a general year on year increase in x-ray investigations; and the prioritisation of other types of radiological examination, which had regional targets for reporting time, over plain x-rays.

A common factor for both trusts was the difficulties faced in recruiting consultant radiologists to vacant posts on a permanent or locum basis. In the light of the findings of Phase 2 of this review, it is recommended that a regional escalation plan is put in place to support any trust which is unable to sustain x-ray reporting levels due to an inability to recruit radiology staff.

In both trusts, the introduction of Computed Radiography (CR) and a digital archive of x-rays generated a significant increase in the number of plain x-rays to be reported. This has been widely documented worldwide in sites where digital technology has been introduced. In addition, both trusts reported a general increase in the number of plain x-rays to be reported.

Each trust advised the review team that the lack of a regional target for plain x-rays, as compared to other forms of imaging, impacted upon priorities for reporting. Nevertheless, there is clear evidence that each trust took steps to seek to address delays in reporting including the allocation of additional resources.

Reporting Policies for Plain X-rays

The review team found that the policies for reporting on plain x-rays were different in the Western and Southern trusts and these impacted on the number of x-rays to be reported.

Before August 2010, in the Southern Trust, plain x-rays requested for hospital accident and emergency (A&E) patients and inpatients were assessed by non-radiological clinicians. These did not receive a routine report by a

radiologist. Concerns were raised by hospital clinicians about the risks associated with not reporting chest x-rays. Routine reporting of these began in August 2010, including all chest x-rays taken from April 2010.

The review team recommends that a standard policy for reporting of plain x-rays should be put in place across Northern Ireland so that there is equality for patients and it is clear to all staff as to which plain x-rays will receive a formal report from radiology. All chest x-rays should be reported by a radiologist.

The Response to Delays in Reporting

The Southern Trust identified that there was a backlog of x-rays requiring reports prior to the introduction of NIPACS in April 2010 and responded appropriately to ensure that reports were generated on NIPACS when it was introduced. Following clinical concerns about the trust policy not to have routine radiological reports on hospital x-rays, the Southern Trust funded the inclusion of hospital chest x-rays for routine reporting in the radiology reporting policy. The full impact of this decision at a time of increased reporting requirements, associated with NIPACS and of additional hospital activity, was not initially realised and led to delays in reporting. In late January 2011 when the trust's chief executive was made aware that the backlog was not being contained, additional funding was made available by the trust. A contract with an independent sector provider was established with delays addressed over a six week period.

From 2008 to 2010, in the Western Trust, actions were put in place designed to address delays in plain x-ray reporting including additional reporting by trust radiologists and establishing a contract with an independent sector provider. However, the measures were not sufficient to deal with a steadily worsening situation in relation to the number of consultant radiologists in post at a time when the demands for x-ray reporting were increasing. Innovative approaches to increasing capacity, by attempting to utilise equipment borrowed from other trusts to facilitate reporting by consultant radiologists in Erne and Tyrone County Hospitals, proved technically unfeasible.

The Western Trust became acutely aware at executive level of the risks to patients through the backlog, particularly for delays in reporting chest-rays following the reporting of two clinical incidents in July 2010. An incident team was established and an action plan was developed to address the backlog as rapidly as possible. Chest x-rays were prioritised for reporting and all plain x-rays were being reported within 28 days. The speed with which the backlog was able to be tackled at this time was facilitated by three factors. A full complement of radiologists was then in post; NIPACS had gone live across the trust, allowing images to be transferred across the trust; and established arrangements were in place to allow plain x-rays from the backlog to be sent to an external provider for reporting.

Regional Communication Arrangements

The review team has concluded that, at regional level, there was no clear awareness of the growing delays in plain x-ray reporting during the periods when backlogs were building up.

In July 2010, the Western Trust reported two clinical incidents relating to delays in reporting, through the serious adverse incident (SAI) procedure, to the Health and Social Care Board (HSCB). Following this report the HSC Board, in partnership with the Public Health Agency (PHA), actively followed up progress on actions to address backlogs in reporting. The HSC Board commissioned an external review of radiology services at the Western Trust.

In August 2010, the HSC Board sought assurance from other trusts as to their position in relation to delays in x-ray reporting. The Southern Trust advised that it had a small backlog which was being addressed. At that time, the Southern Trust had just commenced additional reporting sessions associated with the reporting of hospital chest x-rays and was not anticipating that a significant backlog was to develop over the next few months.

During the period up to March 2011, there were no regional targets for plain x-ray reporting although there were for other types of radiological examination. Routine reports on waiting times for plain x-rays were therefore not being provided to the regional level, which would have indicated delays in reporting, the HSC Board has advised the review team that this information is now routinely collected for plain x-rays.

The review team found that both the Southern and Western trusts have risk registers in place at corporate, divisional and directorate levels. Issues associated with delays in reporting were placed on risk registers and escalated when the situation deteriorated. The risk registers were therefore a potential source of intelligence to identify that problems were occurring in more than one trust. However, risk registers were not routinely shared at any level between trusts, or with the HSC Board, at that time. The review team recommends that a review of risk management arrangements should be carried out to explore the potential for sharing risk registers between organisations to identify emerging issues across trusts.

An inability to recruit consultant radiologists to funded posts was a very significant factor in leading to delays in reporting of plains x-rays in both trusts. In the light of the findings of Phase 2, it is recommended that a system is established to collect and collate information on emerging workforce issues across trusts which could adversely impact on service delivery.

The Impact of Delays for Patients and their Families

The review team considered three cases in the Southern Trust in which there was a delay in diagnosis of lung cancer, potentially linked to a delay in reporting of an x-ray.

In the first case, there was a delay in reporting of a chest x-ray for six months. The primary cause of the delay was not due to a general backlog in reporting of x-rays, but to an administrative error in the manual system for bringing hard copy x-rays in priority order for reporting to consultant radiologists. The patient and family were advised of the delay and that it was not possible to be definitive as to whether the delay in reporting could have impacted on treatment. The risk which led to this delay was eliminated when NIPACS went live with the introduction of computed radiology, which replaced hard copy analogue x-ray film with digital x-ray images displayed on monitors. This incident contributed to clinical concerns about the trust's policy at the time not to have routine radiologists' reports on hospital chest x-rays. The trust established this practice from August 2011.

In the second and third cases there were delays of between two and 4.5 months in reporting chest x-rays during the period after the trust's decision to report on all hospital chest x-rays. The review team was advised that its clinical view is that the delay in the reporting of these two cases was not detrimental to the patients' treatment and care.

The review team considered four cases in the Western Trust which had been identified where there was a delay of between seven and 11.5 months in the diagnosis of cancer. In two cases, delays in reporting of chest x-rays were followed by three month delays in bringing the reports to the attention of the clinical teams who had requested the reports. In one of these cases there was an error, by a radiologist in the independent sector reporting service employed by the trust, in not following red flag procedures at the time of reporting. In two of the four cases, the review team considers that discrepancies in reporting, rather than the delays in issuing the report, were the important factor in leading to the delay in diagnosis. The review team was advised that the delays and discrepancies in reporting may have delayed the start of treatment in each of these cases.

Communication with Patients and their Families

A key part of this review was to learn about the impact of delays in reporting on patients and their families. Two families from the Western Trust area met with RQIA to share their experiences and provided important insights into how the delays in reporting had impacted on them.

Both families were clearly distressed by the impact of the delay in diagnoses for their relative. They were particularly upset by lost opportunities in relation to treatment prospects, clinical management in respect of pain and the possibility of additional life-span. They conveyed their frustration, and at times anger, at what they saw as a failure of the system to deliver prompt care to

their family member. A number of issues around communication were highlighted from initial contact, throughout the ongoing clinical management and communication between the trust and families following the incident. The families also noted that they found media interest generated by these events distressing and intrusive. The families spoke of the personal impact that this and subsequent events had caused them in their grieving process.

The families specifically stated that where a problem is identified it should be handled in an immediate and transparent way. They stressed that honesty, integrity and timeliness should be the values adopted when such incidents occur.

Both families expressed the desire that lessons learned from this series of events should be applied within the HSC to minimise the risk of such events occurring again. In particular, they expressed the view that there is a need to ensure that systems for the reporting of radiological investigations are safe and timely across the healthcare system.

Recommendations

The RQIA review team considers that there are important lessons for HSC organisations from this examination of the circumstances leading to delays in the reporting of plain x-rays and from the experiences of families who were affected by the delays. To this end, the review team has made 14 recommendations to enhance patient safety and to improve communication with patients and families.

Section 1: Introduction

1.1 The Regulation and Quality Improvement Authority (RQIA)

RQIA is a non-departmental public body responsible for monitoring and inspecting the quality, safety and availability of health and social care services across Northern Ireland. It also has the responsibility of encouraging improvements in those services. The functions of RQIA are derived from The Health and Personal Social Services (Quality, Improvement and Regulation) (Northern Ireland) Order 2003.

RQIA operates within a value system that supports the belief that learning is at the heart of improvement. To ensure a clear focus on improvement, organisations need to have effective systems which can identify performance standards and support the learning necessary for improvement.

RQIA's main functions are:

- To inspect the quality of services provided by Health and Social Care (HSC) bodies in Northern Ireland through reviews of clinical and social care governance arrangements within these bodies.
- To regulate (register and inspect) a wide range of services delivered by HSC bodies and by the independent sector. The regulation of services is based on minimum care standards to ensure that service users know what quality of services they can expect to receive, and service providers have a benchmark against which to measure their quality.
- To undertake a range of responsibilities for people with mental ill health and those with a learning disability, following the transfer of duties of the Mental Health Commission to RQIA under the Health and Social Care (Reform) Act (NI) 2009.
- To carry out monitoring, inspection and enforcement of legislative measures for the protection of individuals against dangers of ionising radiation in relation to medical exposure set out in The Ionising Radiation (Medical Exposure) Regulations (Northern Ireland) 2000 (IR(ME)R). RQIA became responsible for functions in relation to IR(ME)R on 15 March 2010.

1.2 Context for the Review

On 15 February 2011, Mr. Michael McGimpsey, MLA, the former Minister for Health, Social Services and Public Safety commissioned RQIA to review the handling and reporting of radiological requests in all health and social care trusts in Northern Ireland. This review was to be completed in two phases.

Phase 1 of the review focused on the systems in place for the handling and reporting on plain x-rays across the five Health and Social Care

(HSC) trusts. An overview report and five individual trust reports on the findings of Phase 1 were published on the RQIA website on 31 August 2011.

The focus of Phase 2 of the review was to examine the circumstances leading to any significant delays in the handling and reporting of plain x-rays in the previous two years, and how those delays were managed.

From the evidence considered during Phase 1, the review team concluded that Phase 2 should focus on delays in the reporting of plain film x-rays which had occurred in the Southern Health and Social Care Trust (SHSCT) and the Western Health and Social Care Trust (WHSCT).

The Minister for Health, Social Services and Public Safety, Mr Edwin Poots, MLA, gave approval to commence Phase 2 of the review on 29 June 2011.

1.3 Terms of Reference

The terms of reference for Phase 2 of the review were:

1. to describe the circumstances leading to the significant delays in the handling and reporting of radiological investigations in the last two years in the Southern and Western Trusts and how these delays have been managed by both trusts and the Health and Social Care Board.

2. to identify any factors which contributed to delays in handling and reporting radiological investigations, in the two trusts, during the past two years and make both generic and specific recommendations for the trusts involved, and, if appropriate, for other HSC organisations;

3. to consider the impact of identified delays to service users; and

4. to examine any other relevant matters emerging during the course of the review.

1.4 The Review Team

The review team included the following membership:

- Dr Nicola Strickland, Registrar of the College and Registrar of the Faculty of Clinical Radiology, Royal College of Radiologists (RCR)
- Sally MacLachlan, Senior Clinical Officer, Medical Exposure Department, Health Protection Agency (HPA)
- Jon Billings, Assistant Director, Revalidation, General Medical Council

- Mrs Elizabeth Knipe, Lay Reviewer
- Dr David Stewart, Director of Service Improvement and Medical Director, RQIA
- Hall Graham, Head of Primary Care and Clinical and Social Care Governance Review and Independent Health Care Regulation, RQIA

Supported by:

- Helen Hamilton, Project Manager, RQIA
- Carolyn Maxwell, Mental Health Officer, RQIA
- Janine Campbell, Administrative Assistant, RQIA

1.5 Methodology Used to Collect Evidence in Phase 2

A. RQIA asked SHSCT, WHSCT and the HSC Board each to provide a timetable of events relating to delays in reporting of plain x-rays, and to submit relevant evidence to inform consideration of these events by the review team.

B. Members of the review team met with managerial and clinical staff in each trust and the HSC Board, to gain further clarification in relation to the written material provided. These meetings took place between 22 and 31 August 2011.

C. RQIA felt it was essential to learn from the experience of families affected by delays in reporting. SHSCT and WHSCT provided information to the review team about specific cases and incidents where there had been delays in diagnosis related to the reporting of plain x-rays. Having considered the information provided, RQIA decided to contact four families in WHSCT inviting them to meet with RQIA. Two families subsequently met with staff from RQIA. RQIA would wish to thank all those involved for their participation, their openness and willingness to share their experience which has been very important in informing the lessons from this review.

The approach adopted by the review team for Phase 2 of this review has been based on the principles of root cause analysis (RCA). The aim of RCA is to identify the factors or "root causes" which led to the circumstances being investigated and to identify lessons which can be applied to reduce the likelihood of this happening again.

RQIA is particularly grateful to the families who shared their experiences in relation to delays in reporting.

RQIA would also wish to thank all HSC staff who provided written material, at short notice, to inform the review process and who met with the review team.

Section 2: Background

2.1 Radiological Investigations

2.1.1 An x-ray image is a picture of the internal structures of the body produced by exposure to a controlled source of x-rays.[1] In the past, these were generally recorded on a sensitive photographic film. In Northern Ireland most x-rays are now recorded in digital form, and shown on a computer screen.

2.1.2 Plain x-rays are single images of one part of the body such as the chest, abdomen or particular bones. The focus of this report is on delays in the reporting of plain x-rays.

2.1.3 X-rays are also used to produce CT (Computed Tomography) scans and fluoroscopic images used in interventional procedures. MRI (Magnetic Resonance Imaging) scans and Ultrasound Scans (US) are imaging studies which do not use x-rays to generate images. In keeping with the terms of reference, this review has not considered the reporting of CT, Fluoroscopy, MRI or US.

2.2 Reporting of Plain X-rays

2.2.1 Clinical radiology is the branch of medicine which originated from the use of x-rays for diagnosis.

2.2.2 Radiologists are doctors who have made a special study of radiology. They carry out the more complex imaging investigations and are responsible for the analysis of the images. They also perform procedures under imaging guidance to obtain samples for pathology and for treating some conditions.[2]

2.2.3 A diagnostic radiographer is a professional trained to produce an image using equipment concerned with the production and detection of radiation. They may also generate images using techniques which do not use ionising radiation.

2.2.4 Following additional training, a diagnostic radiographer may interpret particular images of the body to diagnose injury and disease, for example fractures, and in this case is known as a reporting radiographer.

2.2.5 During their training all doctors receive teaching in interpretation of x-rays. Plain x-rays are often initially seen and interpreted by non-radiologist doctors when a patient is seen in an outpatient department, acutely on the ward or in the emergency department.

[1] Information for patients having an x-ray, Royal College of Radiologists, December 2010.
[2] Common terms compiled by the Patients' Liaison Groups of the Royal Colleges of Radiologists. http://www.rcr.ac.uk

2.3 Discrepancies in Reporting on Radiological Investigations

2.3.1 A reporting discrepancy for an x-ray occurs when a retrospective review, or subsequent information about patient outcome, leads to an opinion different from that expressed in the original report of the x-ray. Not all reporting discrepancies are errors. [3]

2.3.2 Discrepancies in radiological reporting are a well-recognised phenomenon. The Royal College of Radiologists has published standards which require radiology departments to hold discrepancy meetings to review cases. These standards state that potential causes include:

- Inadequate, misleading or incorrect clinical information
- Poor imaging technique
- Excessive workload or poor working conditions
- Observation (including false –positives) or interpretation errors
- Ambiguity of wording of summary or report.

2.3.3 In a review of the discrepancy meetings at one hospital, chest x-rays were the most frequently occurring type of x-ray for discussion comprising 35 per cent of 143 cases reviewed. [4] A review of lung cancer patients at another hospital concluded that: "It is not unusual to find previous significant radiological abnormalities in patients in whom a diagnosis of lung cancer is later made. This leads to a diagnostic delay, which has a significant effect on time to initiation of treatment and palliation of symptoms, although not necessarily on eventual outcome."[5]

2.4 Introduction of Picture Archiving and Communication Systems (PACS) and Radiology Information Systems (RIS)

2.4.1 PACS, in conjunction with RIS, is an electronic system which enables radiology departments to store, rapidly retrieve and share digital x-rays, and their reports, within and between hospitals. Development of PACS has revolutionised the way in which radiology departments, and therefore hospitals, work. PACS enables the electronic storage and organisation of x-rays, removing the need to retain large numbers of hard copy plain x-ray films. PACS and RIS can enable new systems of reporting and new arrangements to monitor the timeliness of reporting to be put in place.

2.4.2 In Northern Ireland the implementation of an integrated solution to the provision of RIS/PACS has been taking place, called NIPACS. This enables x-rays and reports to be viewed by appropriate health

[3] Standards for Radiology Discrepancy Meetings: Royal College of Radiologists, March 2007
[4] Vohrah A. Chandy J. Clinical governance: two years experience of reporting discrepancy review in radiology. Journal of Diagnostic Radiography and Imaging: 2003:5(1): 27-32
[5] Turkington P.M. Kennan N. Greenstone M.A. Misinterpretation of the chest x ray as a factor in the delayed diagnosis of lung cancer: Postgraduate Medical Journal 2002:78:158-160

professionals across the health care network. NIPACS has been designed to integrate the functions of reporting, archiving and communicating x-rays (PACS) with radiology information systems (RIS) and inputting reports through voice recognition software (VR).

2.4.3 NIPACS has been rolled out across trusts in a planned programme of implementation. In the Southern Trust NIPACS went live on 29 March 2010. In the Western Trust NIPACS replaced previous separate PACS and RIS at Altnagelvin Hospital on 24 May 2010.

2.5 Ionising Radiation (Medical Exposure) Regulations

2.5.1 The responsibility for assessing compliance with and enforcing The Ionising Radiation (Medical Exposure) Regulations (Northern Ireland) 2000, known as IR(ME)R, transferred from the DHSSPS to the Regulation and Quality Improvement Authority (RQIA) on 15 March 2010 under The Ionising Radiation (Medical Exposure) (Amendment) Regulations (Northern Ireland) 2010.

2.5.2 The regulations are intended to:

- Protect patients from unintended excessive or incorrect exposure to radiation and ensure that, in each case, the risk from exposure is assessed against the clinical benefit
- Ensure that patients receive no more exposure than is necessary to achieve the desired benefit within the limits of current technology
- Protect volunteers in medical or biomedical, diagnostic or therapeutic research programmes and those undergoing medico-legal exposures
- Ensure that all medical exposures have a documented clinical evaluation

2.5.3 Under IR(ME)R there is a requirement that a documented report is provided for every x-ray investigation, setting out the interpretation of the findings of the investigation. Since the introduction of NIPACS, all reports provided by radiologists and radiographers in the Southern and Western Trusts are now held within NIPACS so that they can be accessed along with the x-ray image.

2.6 Reporting of Serious Adverse Incidents

2.6.1 An adverse incident is defined as any event that could have or did lead to harm, loss or damage to people, property, environment or reputation.[6]

[6] DHSSPS: How to classify adverse incidents and risk guidance, 2006

2.6.2 During the period of consideration of this review, the arrangements for reporting a Serious Adverse Incident (SAI) changed for HSC organisations in Northern Ireland.

2.6.3 The arrangements at the start of the period are outlined in DHSSPS Circular HSC (SQS) 19/2007 which was issued on 30 March 2007. This stated that an incident should be reported to the Department where it is likely to:

(i) be serious enough to warrant regional action to improve safety;
(ii) be of public concern (such as serious media interest); or
(iii) require an independent review.

2.6.4 On 30 March 2009, DHSSPS issued Circular HSC (SQSD) 22/09 to advise HSC organisations of interim arrangements on adverse reporting which were being introduced following a review of the existing adverse incident and learning systems. This circular was issued prior to the establishment of the new HSC Board and Public Health Agency on 1 April 2009. The circular provided guidance on the transition arrangements which were being put in place to manage the phasing out of the Department's existing Serious Adverse Incident reporting system, and the establishment of a new Regional Adverse Incident and Learning (RAIL) system. The interim arrangements required HSC organisations to continue to submit SAIs which met the criteria set out in HSC (SQSD) 19/2007.

2.6.5 From 1 May 2010, revised arrangements were put in place for adverse incident reporting as set out in DHSSPS Circular HSC (SQSD) 08/2010. The requirement to report incidents to the Department ceased at that time. From that date all incidents which met set criteria were to be reported by HSC Trusts to the HSC Board. The criteria are set out in operational guidance for the new arrangements.[7] The criteria for reporting an SAI are defined as:

- "serious injury to, or the unexpected/unexplained death (including suspected suicides and serious self harm) of:
  - a service user
  - a service user known to Mental Health Services (including Child and Adolescent Mental Health Services (CAMHS) or Learning Disability (LD) within the last two years)
  - a staff member in the course of their work
  - a member of the public whilst visiting an HSC facility
- unexpected serious risk to a service user and/or staff member and/or member of the public
- unexpected or significant threat to provide service and/or maintain business continuity
- serious assault (including homicide and sexual assaults) by a service user

[7] HSCB: Procedure for the reporting and follow up of Serious Adverse Incidents: April 2010

- on other service users
- on staff or
- on members of the public

occurring within a healthcare facility or in the community (where the service user is known to mental health services including CAMHS or LD within the last two years).

- serious incidents of public interest or concern involving theft, fraud, information breaches of data loss."

2.6.6 On 28 May 2010, a further circular was issued by DHSSPS to HSC organisations (HSC (SQSD) 10/2010). This circular provided guidance on: "the operation of an Early Alert System, designed to ensure that the Department was made aware in a timely fashion of significant events occurring within the HSC"[8]. The circular required organisations to notify the Department within 48 hours of any event which met one or more of a set of specified criteria as detailed below.

1. Urgent regional action may be required by the Department, for example, where a risk has been identified which could potentially impact on the wider HSC service or systems;
2. The HSC organisation is going to contact a number of patients or clients about harm or possible harm that has occurred as a result of the care they received. Typically, this does not include contacting an individual patient or client unless one of the other criteria is also met;
3. The HSC organisation is going to issue a press release about harm or potential harm to patients or clients. This may relate to an individual patient or client;
4. The media have inquired about the event;
5. The PSNI is involved in the investigation of a death or serious harm that has occurred in the HSC service, where there are concerns that a HSC service or practice issue (whether by omission or commission) may have contributed to or caused the death of a patient or client. This does not include any deaths routinely referred to the Coroner, unless;
    i. there has been an event which has caused harm to a patient or client and which has given rise to a Coroner's investigation; or
    ii. evidence comes to light during the Coroner's investigation or inquest which suggests possible harm was caused to a patient or client as a result of the treatment or care they received, or
    iii. the Coroner's inquest is likely to attract media interest.
6. The following should always be notified:
    i. the death of, or significant harm to, a child, and abuse or neglect are known or suspected to be a factor;

[8] DHSSPS: Establishment of an early alert system, 2010

ii. the death of, or significant harm to, a Looked After Child or a child on the Child Protection Register;
iii. allegations that a child accommodated in a children's home has committed a serious offence; and
iv. any serious complaint about a children's home or persons working there.

7. There has been an immediate suspension of staff due to harm to patient/client or a serious breach of statutory duties has occurred.

Section 3: Southern Health and Social Care Trust

3.1 Radiology Services in Southern Trust

3.1.1 There are four radiology departments reporting on plain x-rays within the Southern Trust, based at Craigavon Area Hospital, Daisy Hill Hospital, South Tyrone Hospital and Armagh Community Hospital. Each hospital reports on the plain x-rays from the group of hospitals linked to it. There are seven locations at which plain x-rays are taken which include Craigavon Area Hospital, Daisy Hill Hospital, South Tyrone Hospital, Portadown Health and Care Centre, Lurgan Hospital, Banbridge Polyclinic and Armagh Community Hospital.

3.1.2 During Phase 1 of this review, RQIA was informed on 14 March 2011, at the time of the review visit to the Southern Trust, that there were no delays in reporting of plain x-rays in relation to a standard of reporting of 28 days.

3.1.3 The Southern Trust advised the review team that it had experienced delays in the reporting of plain x-rays during 2010-11, which had been addressed through a range of measures including additional in-house reporting sessions by radiologists and outsourcing of x-ray reporting to an independent sector provider in England.

3.1.4 The review team concluded that the circumstances leading to delays in reporting of plain x-rays in the Southern Trust should be examined within the terms of reference of Phase 2 of this review.

3.2 Chronology of Events

3.2.1 On 7 January 2010, a physician reported an incident at Craigavon Area Hospital where a chest x-ray, taken in July 2009, had not been reported on by a radiologist. The chest x-ray showed a lung tumour which had been diagnosed following admission to hospital in December 2010. In line with trust procedures an investigation was subsequently initiated to identify those factors which contributed to the incident.

3.2.2 Between January and April 2010 the Southern Trust carried out a programme of actions to prepare for the introduction of PACS into the trust including additional reporting of plain x-rays. The trust had identified that there were delays in reporting of up to 10 weeks for plain x-rays. Additional reporting sessions were funded for trust radiologists, on an out-of-hours basis, to report on approximately 3000 x-rays to ensure that there was a report on these images on the new NIPACS in preparation for the second migration which occurred on 25 April 2010. These x-rays were reported on between 1 March 2010 and 24 April 2010.

3.2.3 On 29 March 2010, NIPACS went live in the Southern Trust.

3.2.4 On 16 April 2010, the Acute Services Clinical Governance Group in the Southern Trust was advised of the arrangements in place for dealing with the delays in reporting.

At this meeting the Associate Medical Director with responsibility for radiology reported on the lack of reporting of plain x-rays which had been present for some time. A&E and inpatient plain x-rays were interpreted by a non-radiologist under protocol and referred as needed to a radiologist. He advised that the Radiology Department had now committed to reporting formally on all chest x-rays on inpatients and A&E patients. The implications of this would need to be quantified in terms of reporting time and finance.

The Associate Medical Director with responsibility for radiology advised that for those x-rays other than chest x-rays, which would not be officially reported on by radiology, each Associate Medical Director and their consultants were required to sign up to a protocol that the referrer accepted the responsibility to report on the x-ray.

It was agreed at the meeting that the non-reporting of plain x-rays should be placed as a high level risk on the Divisional Risk Register. It had previously been on the radiology service risk register from January 2009. It was also agreed that the reporting protocols should be reviewed in the light of the implementation of NIPACS.

3.2.5 On 28 April 2010 the issue of plain film x-ray reporting by radiologists was escalated to the Acute Services Directorate Risk Register.

3.2.6 In May 2010, the Head of Diagnostics in the Southern Trust prepared a briefing paper on the reporting of plain x-rays for the trust. This paper described the workload and finance implications of three scenarios:

A. There was an immediate capacity gap of 4.5 reporting sessions of consultant radiologist's time per week under the existing protocol. A backlog of 4,272 plain x-rays had built up which would require an additional 34 sessions to clear.
B. Chest x-rays had been identified as the highest risk to patients associated with unreported plain x-rays. Implementing the policy of reporting on all A&E and inpatient chest x-rays would result in an additional 26,000 x-rays per year which would be a further 8.8 reporting sessions per week.
C. Reporting on all plain-rays would require an additional 32 sessions of reporting time per week over the existing sessions available.

The paper recommended that consideration should be given to outsourcing of reporting of some plain x-rays to an external agency.

3.2.7 On 24 May 2010, a group of physicians in Craigavon Area Hospital sent a letter to the Medical Director setting out their concerns about the

lack of reporting of plain x-rays of inpatients and lengthy delays in reporting of A&E and outpatient x-rays. The letter stated that:

"We believe, and have evidence in specific cases, that patient safety is being severely compromised by the inadequate plain film reporting services. While we as physicians have some knowledge and competence in interpretation of plain films, (through experience, training and discussion with radiologist colleagues at multidisciplinary meetings and teaching sessions), we have a duty to acknowledge the limits of our expertise. We should not be expected by trust management to practice outside the limits of that expertise, compromising our professional integrity and patient safety."

The letter expressed support for radiologist colleagues who were "actively negotiating with trust management to adequately resource the plain film reporting service".

3.2.8 On 25 May 2010, a Root Cause Analysis report was finalised on the investigation of the incident reported in January 2010 (3.2.1 above). The report described the circumstances leading to a delay in reporting of the chest x-ray. The x-ray was a hard copy film produced before NIPACS was installed. Although, as an outpatient x-ray, this x-ray was allocated for reporting in line with the existing protocol, it was left on a wrong shelf and not reported. A manual administrative system, for rotating x-rays between shelves to bring them in date order to the attention of a radiologist for reporting, had not been adhered to. This rotation system was discontinued when PACS introduced computed radiology. The report set out an action plan to implement recommendations arising from the investigation of this incident.

3.2.9 In June 2010, the Trust Medical Director agreed a process with the Associate Medical Director with responsibility for radiology for a discussion with consultants to resolve the issues set out in the letter from the consultants of 24 May 2010.

3.2.10 In August 2010, additional x-ray reporting sessions by trust radiologists were commenced following allocation of non-recurrent funding through the Managed Clinical Network for Radiology in the Southern Trust. The additional sessions were to address the existing backlog in reporting of chest x-rays and to introduce the routine reporting of A&E and inpatient chest x-rays by radiologists. It was decided that reporting should include all chest x-rays taken from 1 April 2010.

3.2.11 In August 2010, the Southern Trust was asked by the HSC Board to describe its position in relation to x-ray reporting following receipt of a Serious Adverse Incident from the Western Trust. The Southern Trust reported that there was a backlog and a plan was in place to clear this by September 2010.

3.2.12 On 7 October 2010, the issue of plain x-ray reporting was moved back to the Divisional Risk Register from the Acute Services Directorate Risk Register.

3.2.13 On 14 October 2010, an outpatient chest x-ray, performed in May 2010 as part of routine pre-operative screening, was reported. In view of the findings a follow up x-ray was advised. Following further investigations, the patient was subsequently confirmed to have lung cancer.

3.2.14 On 9 November 2010, an outpatient chest x-ray performed in September 2010 was reported and the patient referred for urgent assessment. Following this assessment which confirmed a tumour, the consultant completed an incident report form as there was evidence of this tumour on earlier x-rays dating from 2009 and 2010 which had not been identified at that time. An incident investigation was subsequently carried out and the case was referred for consideration by the trust radiology discrepancy meeting to identify any learning points arising from the case.

3.2.15 On 13 January 2011, a group of consultant surgeons, consultant anaesthetists and associate specialists in surgery in the Southern Trust wrote to the Medical Director setting out their concerns on the reporting of plain x-rays and asking that these concerns be addressed as a matter of priority by trust management. The letter stated that:

"Although interpretation of plain films by a registered medical practitioner may facilitate compliance with IRMER regulation, the formal report by a qualified radiologist is a valuable backup for patient safety and clinical care. Any negligence claims arising from missed abnormalities on non-reported plain film x-rays may well be indefensible."

3.2.16 On 28 January 2011, a meeting was held involving the Chief Executive of the Southern Trust, the Director of Acute Services and radiology representatives to discuss delays in reporting of plain x-rays. It was decided to act, at financial risk, to manage a growing backlog and to prioritise chest x-rays for reporting. An action plan was agreed which included:

- Securing additional internal reporting
- Setting up a contract for independent sector provision
- Establishing arrangements for performance management reporting
- Updating a capacity and demand analysis
- Reviewing job plans of radiologists
- Reviewing the capacity of x-ray rooms
- Engaging with clinicians to reach agreement on which images would be reported by them without a routine report from a radiologist.

3.2.17 On 7 February 2011, an email was sent to a number of media organisations and politicians from an individual stating that he was a patient receiving care at Craigavon Area Hospital. The email stated that the patient had a chest x-ray taken in November 2010 which had not been reported on by a radiologist and that his consultant had told him that there were 35000 x-rays at Craigavon which were not reported by a consultant radiologist. The e-mail also alleged that issues were frequently reported to the trust management on incident forms but that the trust policy was not followed.

3.2.18 On 8 February 2011, the Chief Executive of the Southern Trust sent an email to the recipients of the email of the previous day advising that an extensive search of patient records had been unable to identify an individual who matched the details provided. The HSC Board and the DHSSPS were also informed. The Chief Executive advised that there were then no chest x-rays waiting longer than 28 days to be reported and that: "there is currently a small number of very low risk outpatient-rays to be reported on, but these will be complete by the end of February".

3.2.19 On 10 February 2011, the Chief Executive of the HSC Board wrote to the Chief Executive of the Southern Trust and stated that it was: "a cause of considerable concern that a recent review by the Board of the information available from NIPACS has revealed a position which is inconsistent with that reported in August, with a significant number of unreported plain films." The Chief Executive of the HSC Board asked for assurance by return that this matter was being urgently addressed and effective arrangements were in place to avoid any reoccurrence.

3.2.20 On 10 February 2011, the Southern Trust appointed an independent sector provider in England, to report on 4000 to 5000 plain x-rays during February and March 2011.

3.2.21 On 14 February 2011, the Chief Executive of the Southern Trust replied to the Chief Executive of the HSC Board stating that the trust had insufficient funded capacity to deliver on the current demands on the service. The Chief Executive advised of the actions which were being taken, at financial risk to the trust, to deal with a backlog in reporting. The Chief Executive of the Southern Trust requested urgent regional/commissioner action including:

- Guidance on the application of IRMER regulation to specific plain x-rays which do not require reporting by a consultant radiologist due to the expertise of the receiving clinician.
- A regional review to establish priorities for urgent capital investment.
- Consideration of productivity levels for diagnostic services
- Revisiting of the targets for diagnostic services as plain x-rays were excluded from the targets.

3.2.22 On 15 February 2011, the Southern Trust achieved an internal standard of 28 days for reporting of chest x-rays.

3.2.23 On 16 February 2011, an unnamed consultant at Craigavon Hospital was reported in the media to have alleged that he had serious concerns about missed diagnoses related to non-reporting of x-rays. The media reports quoted from the letter from consultant physicians of 24 May 2011 (3.2.7 above).

3.2.24 On 16 February 2011, a meeting was held in the Southern Trust involving the Chief Executive, Medical Director and Associate Medical Directors to discuss the issue of reporting of plain x-rays and clinical risks associated with this. It was agreed that the radiology department would work with clinical colleagues, to develop a facility for them to highlight electronically those x-rays, not included in the groups designated for routine reporting by radiology, which they felt would need a report from a radiologist.

The meeting unanimously agreed that it was disappointing that a senior member of staff had not felt able to use existing mechanisms to raise concerns about services and had reported these in the media anonymously. The Chief Executive confirmed that there would be no negative consequences for this member of staff, should his or her identity be revealed. She stated that whilst the trust had a whistle blowing policy, the priority was to ensure safe services.

3.2.25 On 17 February 2011, the Southern Trust established a helpline for patients following media coverage of issues relating to the trust, including the reporting of plain x-rays. The helpline did not receive any calls relating to plain x-rays and was stood down on 23 March 2011.

3.2.26 On 22 February 2011, the Chief Executive of the Southern Trust briefed the Health Committee on issues in the trust including the reporting of plain x-rays.

3.2.27 On 18 March 2011, the Southern Trust achieved an internal standard for all plain x-rays designated for radiology reporting to be reported in 28 days.

3.2.28 On 21 March 2011, the HSC Board convened a workshop on "Modernising Radiology in Northern Ireland" chaired by the Chief Executive.

3.3 Factors Leading to Delays in Reporting Plain X-rays

3.3.1 The review team found that there were three main factors which led to delays in reporting of plain x-rays in the Southern Trust in 2010 and early 2011.

(i) Lack of consultant radiologists

During the period from 2009 to 2011 the Southern Trust had consultant radiology posts which were funded but unfilled. There were no applicants for a post advertised in September 2009 and only one applicant (who withdrew) when a post was advertised in March 2010. At the time of the RQIA team visit to the trust in March 2011 there were 3.1 WTE consultant vacancies not covered by locum doctors.

(ii) Introduction of NIPACS

NIPACS went live in the Southern Trust on 29 March 2010. In preparation for the introduction, a backlog of some 3000 x-rays was reported in March and April 2010, to ensure that there would be reports on these x-rays in the new system.

Following the introduction of NIPACS there was a significant increase in the number of plain x-rays to be reported, as previously some x-rays had not been returned to the radiology department for reporting. This is a recognised and predictable by product of introducing a PACS system and is not exclusive to the Southern Trust.

Introduction of NIPACS also highlighted the requirement under IR(ME)R that all x-rays required a written report. Prior to NIPACS, it was expected that some plain x-rays would be reported by clinicians outside of the radiology department, as laid out in the trust policy for radiological reporting. Electronic x-ray records highlighted this situation to clinicians, raising their awareness of this requirement. This led to significant concern about the lack of radiological reporting of plain x-rays in the trust.

Clinical staff advised the review team that they did not feel the full benefits of NIPACS were being realised in the trust and there was a need to ensure that the system was customised to meet individual requirements at clinical level.

(iii) A policy decision to introduce routine reporting of chest x-rays for hospital patients

During the period up to the introduction of NIPACS it was not routine practice at Craigavon Hospital for radiologists to report on plain x-rays for A&E or inpatients except on request from the patient's consultant. In Daisy Hill Hospital the routine reporting of plain x-rays for hospital inpatients was ceased in 2009 following a reduction in available consultant staffing due to consultant illness and human resource issues.

In April 2010, the Associate Medical Director with responsibility for radiology advised that all chest x-rays should be reported by a radiologist as it was considered that they constituted the highest risk to patient care among unreported plain x-rays. This proposed policy

change was influenced by a case of a patient who had experienced a delay in reporting of an outpatient chest x-ray.

The new policy was implemented in August 2010 with a decision taken to include all chest x-rays taken from April 2010 so there would be a report on NIPACS. In total it was estimated that this change in policy would increase the number of x-rays to be reported by 26,000 per year.

3.3.2 A further factor contributing to the size of the backlog was an increase in the number of elective patients treated from December 2010 to March 2011. Allocation of funding late in the financial year for additional elective surgical, medical and gynaecology outpatient clinics, led to an increase in the number of x-rays being undertaken and therefore increased the number that required reporting.

3.3.3 The Southern Trust advised the review team that, for the period from April 2010 until February 2011, accurate management reports on reporting times were not available from NIPACS and this impacted upon the ability to monitor, manage and respond to delays in reporting.

3.3.4 Throughout the period when there were delays in reporting of plain x-rays in the Southern Trust there was no regional target for reporting times for plain x-rays. There were targets for other types of radiology investigation. Although this may have impacted on the prioritisation of these other radiological investigations over plain x-rays in February and March 2011 the trust did invest in additional plain x-ray reporting to prepare for NIPACS, to introduce reporting of all hospital chest x-rays and to tackle a backlog.

3.4 The Response to Delays in Reporting Plain X-rays

3.4.1 Prior to the introduction of NIPACS, the Southern Trust identified a backlog of some 3,000 plain x-rays and agreed to fund additional sessions by trust-based radiologists in March and April 2010 to deal with this.

3.4.2 The trust responded to concerns raised by radiologists and other consultants about risks to patient safety, due to the policy of non-radiological reporting of some plain x-rays, by agreeing to fund the reporting of chest x-rays which were assessed as the greatest risk. This decision contributed to a further backlog in reporting later in 2010.

3.4.3 The review team was advised that it is not always clear to clinical staff which plain x-rays would be reported at the time of request of the x-ray and it would be helpful, particularly for new staff, to have a short document which clearly set out the arrangements.

3.4.4 In January 2011, it was recognised that the backlog was not being contained. The trust agreed to proceed, at financial risk, to increase the number of additional sessions of reporting time and entered into a

contract for additional reporting in the independent sector. By 18 March 2011 the trust reached a position where plain x-rays allocated for radiological reporting in the trust reporting policy were being reported within 28 days. Daily monitoring of numbers of x-rays waiting for reporting was commenced.

3.4.5 Issues in relation to delays in reporting of plain x-rays were placed on the Divisional risk register and escalated to the Acute Directorate risk register when the risk was assessed to have increased.

3.5 The Impact of Delays in Reporting for Patients

3.5.1 The RQIA review team was advised by the Southern Trust of three cases, during the period from July 2009 to March 2011, in which an incident had been reported where there had been a delay in reporting of a plain x-ray. The review team discussed these cases with clinical and radiological consultants and reviewed the response to the reporting of the incidents.

3.5.2 In the first case, an outpatient had a chest x-ray taken in July 2009 which was not reported by January 2010. By this time the patient had been diagnosed as having lung cancer. This was visible on the initial chest x-ray when it was reported. The patient's consultant reported this incident and an investigation was carried out into the circumstances leading to the delay. The investigation found that the cause of the delay was that a manual system for rotating hard copy x-ray films between shelves to bring them to the attention of radiologists for reporting in chronological order had not been complied with. This x-ray had remained unreported while more recent x-rays had been reported upon.

3.5.3 The review team found that although this delay had not been primarily due to a backlog in reporting but to an administrative error, the incident contributed greatly to concerns about the risks to patient safety from the non-reporting of chest x-rays. This in turn led to the change in reporting policy to report all chest x-rays.

3.5.4 The review team considers that this case illustrates a particular risk associated with manual systems of storing hard copy x-ray images. The introduction of NIPACS has eliminated this risk as all images are now retained on a computer database and delays in reporting can be readily identified.

3.5.5 The patient's consultant advised the patient and family of the delay at the time it was discovered, and that it was not possible to give a definitive answer as to whether the delay in reporting could have led to a different course of treatment for the patient.

3.5.6 A second incident was reported in which a chest x-ray was performed in May 2010 as a routine x-ray before an elective surgical procedure. It

was reported in October 2010 when the report stated that there were abnormal findings with follow up advised. A follow up x-ray was arranged which was reported within two days. The patient was subsequently diagnosed with lung cancer. The review team has been advised that the clinical view in this case is that an earlier diagnosis would not have changed the management plan for this patient. The patient's GP was advised of the delay in reporting of the chest x-ray in this case.

3.5.7 This case occurred at the time when there was a delay in reporting of chest x-rays following the introduction of a new policy to report on all chest x-rays for hospital in-patients. This policy commenced in August 2010, but it was decided to include reporting of all chest x-rays which had been taken since April 2010.

3.5.8 A third incident was reported by a consultant physician where a patient had a chest x-ray taken in September 2010 which was not reported until November 2010. This x-ray report led to further investigations which confirmed a diagnosis of lung cancer. The consultant physician reviewed previous x-rays for the patient and found that a tumour, although smaller in size, could be seen on earlier x-rays dating back to March 2009. An investigation of the incident was carried out and the case was referred for consideration at the subsequent radiology discrepancy meeting.

3.5.9 The patient's consultant advised the patient and family about the delay in reporting. The review team was advised that the clinical view is that the two month delay in reporting the chest x-ray between September and November 2010 was not detrimental to the patient's treatment or care.

3.5.10 The review team considers that the policy change to have a radiological report on all hospital chest x-rays was an important measure in reducing the risk of such an incident happening again. The incident also illustrates that discrepancies can occur when x-rays are reported (see section 2.3).

3.5.11 The review team found that these three incidents in which there was concern that delays in reporting chest x-rays had led to delays in diagnosis of cancer were appropriately reported by the patient's consultant though the trust's incident reporting system. The circumstances leading to these incidents were investigated.

3.5.12 The review team was advised by trust governance leads that it was considered that none of the incidents met the criteria for reporting as an SAI under the extant criteria at the time of the incident as set out in section 2.6. The first incident occurred during the period before responsibility passed from the DHSSPS to the HSC Board. The second and third incidents occurred following the transfer of responsibility to the HSC Board.

3.5.13 Following the receipt of an email on 7 February 2011 which made serious allegations about radiology services in the trust, the Chief Executive immediately investigated the incident and advised the DHSSPS and the HSC Board of the findings on the following day, which was in keeping with the requirements of the early alert arrangements.

Section 4: Western Health and Social Care Trust

4.1 Radiology Services in Western Trust

4.1.1 The Western Trust has established a single management structure for radiology services across the trust with shared services including Computed Tomography (CT) and Ultrasound. The Altnagelvin Hospital Radiology Department reports on plain x-rays from Altnagelvin and Roe Valley Hospitals and the Erne/Tyrone County Radiology Department reports on plain x-rays from Erne and Tyrone County Hospitals.

4.1.2 During Phase 1 of this review, RQIA was informed on 11 March 2011 by the Western Trust that there were no delays in the reporting of plain x-rays at any of the hospitals in the trust in relation to a standard of reporting of 28 days.

4.1.3 The Western Trust advised the review team that significant delays had occurred at Altnagelvin Hospital in the reporting of plain x-rays between 2008 and 2010 but that no delays had occurred at Erne and Tyrone County Hospitals.

4.1.4 The review team concluded that the circumstances leading to delays in reporting of plain x-rays at Altnagelvin Hospital between 2008 and 2010 should be examined within the terms of reference of Phase 2 of this review.

4.2 Chronology of Events

4.2.1 In May 2008, Computed Radiography (CR) for plain x-rays was introduced at Altnagelvin and Roe Valley Hospitals. Prior to this date, plain film radiography was undertaken using conventional film and processing techniques. Following implementation, there was an obvious impact on the number of plain x-rays to be reported as previously 15-20 per cent of plain x-rays did not get returned to the radiology department.

4.2.2 In June 2008, two consultant radiologists retired from Altnagelvin Hospital who had previously reported on 44 per cent of plain x-rays at the hospital during 2007. Over the next three years the trust had limited success in recruiting consultants on a permanent basis.

4.2.3 In September 2008, the Western Trust Divisional Clinical Director for Diagnostics moved to a different post and the resulting vacancy remained unfilled although it was advertised six times.

4.2.4 Between March and June 2009, the Western Trust acted to increase reporting capacity in Altnagelvin Hospital for plain x-rays. The trust sourced additional radiology reporting stations and installed them at Tyrone County and Erne Hospitals. The aim was to transfer images for reporting, but the transfer time proved too slow to be useful.

Radiologists at Altnagelvin Hospital provided additional reporting sessions and a radiologist from the Erne Hospital commenced travelling to Altnagelvin Hospital to report on plain x-rays.

4.2.5 On 24 August 2009, the Radiology Services Manager prepared an update paper on the backlog in outpatient reporting. The paper stated that there were a total of 11,213 plain x-rays waiting to be reported at that time at Altnagelvin Hospital. The paper set out the arrangements in place for prioritisation of plain x-rays by the radiology department and turnaround times for each priority group, as shown in the table below:

Priority	**Referral Source**	**Turnaround times**
1	Accident and Emergency Department	1-5 days
2	General Practitioner	1-5 days
3	Films identified as urgent by radiographers	1-5 days
4	Inpatient	1-21+ days
5	Outpatient General Medical & others	3+ months
6	Orthopaedics	6+ months

The paper described the factors contributing to the delays which included:

- 1.5 vacant consultant radiologist posts and periods of consultant leave
- Pressure to ensure CT, MRI and Ultrasound sessions were maintained leading to multiple interruptions to radiologists reporting plain x-rays
- Pressure to ensure that waiting time targets were met resulting in a lower priority for plain x-rays which were not included in targets at that time
- Increased numbers of plain x-rays for reporting due to introduction of CR
- Difficulties in defining job plans for consultants ensuring sufficient weight was given to plain x-ray reporting

The paper stated that the issue had been recorded on the radiology department risk register and reported to senior management. It was proposed to offer additional sessions to radiologists across the trust to clear the backlog in reporting.

4.2.6 On 26 August 2009, the Western Trust Integrated Clinical and Social Care Governance Committee received the Acute Services Governance Report for the quarter ended June 2009 which stated that: “Delays in plain film reporting are now impacting on turnaround times. There are various actions in place to minimise the delays. However, the shortfall in radiology reporting is having a major impact on the process. The new CR system has resulted in a major increase in the number of films available for reporting and there has been a general increase of around 14 per cent in the number of plain films performed on the Altnagelvin Hospital site since Jan 09”.

4.2.7 On 4 September 2009, the Western Trust Elective Access Steering Group agreed that funding could be used for additional radiology reporting sessions to clear the plain film backlog and to recruit 2 WTE radiologists. A service development proposal was presented to establish an independent sector contract for radiology reporting. This would include up to 2,000 plain x-rays per month.

4.2.8 In October and November 2009, practical and funding issues associated with establishing a possible independent sector contract for reporting x-rays for the period up to 31 March 2010 were considered.

4.2.9 On 11 December 2009, the Commissioning Lead for the Western Local Commissioning Group of the HSC Board wrote to the Western Trust Acting Director of Acute Hospital Services following a performance management meeting held on the previous day. The letter asked for clarification of the challenges facing the trust in maintaining key radiology staff at Altnagelvin Hospital. The trust was asked to advise on what the impact on performance would be of consultant vacancies in radiology and what the trust was doing to mitigate any adverse impact.

4.2.10 On 13 January 2010, the Western Trust Acting Director of Acute Hospital Services replied to the letter of 11 December 2009 setting out the staffing position and the actions being taken to mitigate any adverse impact. The letter stated that the establishment of consultant radiologists would be 13 consultants with effect from March 2010. Of this total of 13 posts there were six vacancies at 1 January 2010 (3 permanent and 3 temporary). There was the potential for 2 further vacancies in mid 2010.

4.2.11 In February 2010 the Western Trust agreed a contract with an independent sector provider for radiology reporting. The first x-rays were reported on 4 March 2010.

4.2.12 On 11 March 2010, the lead clinician for radiology raised concerns with the Medical Director about unreported radiographs. Later that day, the Medical Director sent an email to the Acting Director of Acute Hospital Services acknowledging that this was recorded on the Directorate risk register but drawing attention to media reports of a backlog at a

hospital in the Republic of Ireland. She stated that it would be timely to review the action plan against this risk and to ensure that there was a timeline attached to address any outstanding reports.

The Acting Director of Acute Hospital Services replied that the trust was: “in a slightly different position here, advice has been given to the department to undertake a simple “sign off” protocol which would mitigate the risk (basically the patients’ main consultants see them rather than the radiographers) this is acceptable as they have been reviewed. I am waiting for it on route to Acute Governance where it will be signed off”.

A series of emails followed over the next two days between the Acting Director of Acute Hospitals, Medical Director and Lead Clinician as to which x-rays required to be reported by radiologists and which could be reported by other clinicians. The Lead Clinician advised that the: “Only thing we agreed as radiologists not to formally report was the follow up fractures after 1st film post initial treatment with that loop never formalised”.

4.2.13 On 23 March 2010 a draft update paper, prepared by the Radiology Service Manager, on the backlog in radiology reporting, was considered at a radiology meeting in the Western Trust. The paper stated that the position had significantly worsened since August 2009. It was now estimated that the introduction of CR had led to an increase in reporting of 25 per cent for plain x-rays. Approximately 20,000 (6,750 inpatient and 13,250 outpatient) plain x-rays had not been reported by radiologists in 2009/10 out of a total of 94,000 taken at Altnagelvin, and Roe Valley Hospitals. A sample of the unreported x-rays was reviewed and not all would have required a report under the existing protocol.

An action plan was developed by the Service Manager to tackle the backlog including:

- Continuing to seek to recruit to vacant posts
- Redrafting of consultant job plans
- Acting to prevent interruption and disruption during reporting sessions for plain x-rays
- Ensure that all unreported x-rays relating to an individual patient are reported at the same time
- Enhance the number of reporting workstations to avoid access delays
- Ensure that x-rays not requiring reports are appropriately flagged
- Additional sessions of radiology reporting by trust radiologists and recruitment of retired radiologists
- Further outsourcing to independent sector partners
- Develop Key Performance Indicators for plain x-ray reporting

- Carry out a risk assessment as to which plain x-rays require a radiological evaluation
- Benchmark position against other trusts with regard to reporting arrangements

4.2.14 On 26 March 2010, the Western Trust Medical Director met the Acting Director of Acute Hospital Services, Lead Clinician and a senior radiologist and agreement was given to act to clear the backlog in radiology reporting, dating from February 2009, with immediate priority to be given to chest x-rays. The action plan prepared by the Radiology Service Manager was agreed for implementation and funding made available.

4.2.15 On 24 May 2010, NIPACS went live in the Western Trust which replaced the previous radiology information system (NIRADS) at Altnagelvin Hospital. As part of the implementation process, printed x-rays stopped being sent to wards as these could now be viewed on ward based monitors.

4.2.16 On 11 July 2010, a consultant physician raised concerns by e-mail with the Radiology Department Manager at Altnagelvin Hospital about delays in receiving reports on x-rays for his patients. He advised that the delayed reports related predominately to x-rays performed in 2009. The reports were dated April or May 2010 but were only being received by secretaries in July 2010. He asked: "Why is this? Where have they been for 2 or 3 months? This causes me grave anxiety." He described two patients in which this occurred and that he was intending to refer one of these as a Serious Adverse Incident.

4.2.17 On 13 July 2010, the Radiology Department Manager completed two incident reporting forms.

The first described an incident in which a chest x-ray performed on a patient on 13 August 2009 was not reported until 31 March 2010 when the radiologist from an outsourced reporting service raised the possibility of a lung tumour. In July 2010, having received the report, the GP contacted the radiology department. There were two delays. The first delay (to 31 March 2010) was due to a backlog in plain film reporting. The second delay was still under investigation.

4.2.18 The second described an incident in which a patient had a chest x-ray on 26 February 2010 which was still unreported on 11 July 2010. The patient had been seen during this period and had been diagnosed with a lung tumour. The Western Trust's Chief Executive was advised verbally by the Head of Quality and Safety about these incidents and asked for further information to be provided.

4.2.19 On 19 July 2010 a briefing document was provided for the Western Trust Chief Executive to provide responses to specific questions she

had asked about the circumstances at that time. The information provided included:

- There were now two identified backlogs in reporting plain x-rays. One related to x-rays on the old NIRADS system up to 24 May 2010 amounting to 19,500 x-rays. There was now a new backlog of plain x-rays on the NIPACS system which went live on 24 May 2010.
- The NIRADS backlog had been prioritised into different risk groups with the longest waiting time dating from 1 January 2009.
- The radiology department estimated that there was a shortfall in reporting capacity of 500 plain x-rays per week.
- In total there were 10 consultant radiologists in post (including three locums) out of a funded establishment of 13.3 posts.
- Options to tackle the backlogs included using in-house radiologists and additional independent sector radiologists.
- The independent sector service had reported on 2,438 plain x-rays since the service went live on 4 March 2010.

4.2.20 On 27 July 2010, a Radiology Incident Review Team, chaired by the Medical Director, was established by the Western Trust. The team agreed a set of initial actions including processes to ensure that appropriate arrangements were in place to expedite x-rays with "red flags".

4.2.21 On 28 July 2010, the Western Trust reported a Serious Adverse Incident (SAI) to the HSC Board and the Public Health Agency (PHA), in line with their requirements, which was described as:

"Trust aware of the risk of a backlog of unreported x-rays and a plan was in place to address the backlog. On the 13 July 2010 it was discovered that two patients who had unreported x-rays have been diagnosed with cancer".

4.2.22 In addition, on 30 July 2010, the Medical Director of the Western Trust advised DHSSPS verbally about the SAI.

4.2.23 On 3 August 2010, the Western Trust Incident Review Team met and agreed a plan to clear unreported plain x-rays. The plan set out a three strand approach:

- For the old NIRADS system there were now estimated to be 18,500 plain x-rays to report. These would be outsourced to the independent sector provider. Chest x-rays and non-orthopaedic x-rays were to be prioritised. Chest x-rays (3,402) were to be reported within 4 weeks and the other prioritised x-rays (4,643) in a further 4 to 5 weeks. The remaining 10,400 plain x-rays were orthopaedic.
- There were now 3,500 plain x-rays to report on the new NIPACS and these would be reported by trust radiologists.

- A capacity plan would be developed to discuss with the HSC Board to address an ongoing gap in reporting capacity of 650 plain x-rays per week.

4.2.24 On 5 August 2010, the Western Trust Medical Director briefed the Trust Board on unreported plain x-rays and the action plan in place to address these.

4.2.25 Following the receipt of the SAI, a consultant in public health medicine was appointed, on behalf of the HSC Board and PHA, as the Designated Review Officer (DRO) for the incident. He contacted other trusts in early August to ascertain whether they had a similar backlog. The HSC Board asked for a formal position on this issue. Three of the other four trusts confirmed a satisfactory position. The Southern Trust reported a backlog and a plan in place to clear it by early September 2010.

4.2.26 On 6 August 2010, an update report on the SAI and the action plan to address the backlogs was forwarded by Western Trust to DHSSPS, the HSC Board and PHA. Following receipt of the plan, the DRO advised the Western Trust Medical Director that the recovery plan appeared reasonable but that the timescales for the exercise should be cut if possible. He asked for a final report through the SAI system within 12 weeks advising on the incident, how it had been resolved and the steps being taken to ensure it does not happen again.

4.2.27 On 6 August 2010, the Western Trust Medical Director wrote by e-mail to the independent sector provider and stated that a chest x-ray reported by the company which should have been reported as a “red flag” was not reported as such. As a result there appeared to have been a delay in diagnosis of cancer in a patient. The company was asked to provide a report detailing what had occurred within the company leading to the return of the x-ray report without a red flag. The Medical Director asked for assurance that any errors or omissions had been identified and addressed.

4.2.28 On 10 August 2010, the issue of the delay in reporting plain x-rays in the Western Trust was discussed at the HSC Board Senior Management Team. It was agreed that an action plan should be sought from the Western Trust and an external review would be initiated to understand how this situation had arisen and to ensure that there would be no risk of recurrence.

4.2.29 On 13 August 2010, the Chief Executive of the HSC Board wrote to the Chief Executive of the Western Trust stating that it was essential that the backlog was cleared as quickly as possible and that appropriate steps were taken to ensure the timely reporting of all radiological tests in the future. The HSC Board and PHA required that no report was to be outstanding for more than 28 days by the following deadlines:

- Chest x-rays backlog to be cleared urgently at the latest by 20 August 2010
- Non-orthopaedic x-rays backlog to be cleared by 3 September 2010
- All remaining x-rays – backlog to be cleared by 1 October 2010

An action plan was be provided by 18 August 2010. The letter also advised the Western Trust that an external review process had been initiated by the HSC Board and PHA to establish how the backlog in plain x-ray reporting arose, how it was managed, and to ensure that appropriate trust-wide service arrangements were in place going forward.

4.2.30 On 13 August 2010, the DRO contacted the Royal College of Radiologists (RCR) in relation to the external review. He was advised that a request for a review would be brought to the RCR Service Review Committee at the end of September 2010 and if accepted, there would be a six week lead time for the review to then take place.

4.2.31 On 16 August 2010, the Chief Executive Officer of the independent sector provider wrote to the Western Trust Medical Director enclosing the report of an investigation into the Serious Adverse Incident which had been reported to the company on 6 August 2010.

Having reviewed the operational logs for the incident there was no record of a request to "red flag" the report by the reporting radiologist. The reporting radiologist, having reviewed his reporting of the case, stated that it was clear that the film required a "red flag" notification. He had no record of implementing such a notification although he had done this for at least two other Western Trust x-rays. He could not provide an explanation as to why he had not done this. He stated that this was clearly an omission on his part and apologised for this omission. He offered to speak to the patient if it was felt that this would be of benefit.

4.2.32 On 17 August 2010 the Western Trust submitted a first progress report to DHSSPS and HSC Board. Of 6,902 chest x-rays waiting to be reported on 3 August 2010, 5,281 had already been reported. (The figure '6,902' comprised the 3,402 chest x-rays affected by the delay in reporting and recently performed chest x-rays not yet reported). The trust continued to provide weekly monitoring reports as the backlog was cleared over subsequent weeks.

4.2.33 On 23 August 2010, the report of the investigation into the SAI reported on 28 July 2010 was completed. The investigation found that:

- A chest x-ray for an inpatient dated 13 August 2009 was not reported until 31 March 2010. There was no record that a doctor had reviewed the x-ray when assessing the patient on the ward. The x-ray was forwarded to the independent sector provider as

part of the backlog management. The findings were not reported as a “red flag” in line with the terms of the contract with the independent sector provider. This led to a further delay in recognising the significance of the findings of the x-ray until July 2010 when a junior doctor read the x-ray report and acted immediately to contact the patient’s GP.

- An outpatient chest x-ray dated 26 February 2010 was not reported by the time the patient’s GP requested a further chest x-ray in May 2010 in view of the patient’s symptoms. The first x-ray was reported on 14 June 2010 as “no active lung pathology identified”. Subsequent clinical advice was that a cancer would not have been identified in the initial chest x-ray. It was concluded that this case no longer met the criteria for reporting as an SAI.

The investigation report made recommendations for immediate actions including:

- An urgent review of capacity to report plain x-rays should be carried out across the trust. A function on the NIAPACS system should be implemented in all radiology departments to identify those x-rays which had not been reported within accepted time frames.
- The implications of incorrect recording and allocation of x-rays should be emphasised to all staff.
- Radiologists and secretary/typists should be made aware of the need for appropriate report production and placement to ensure all relevant examinations are viewed and reported.
- There should be a clear understanding and record of those examinations where there is agreement between clinical departments and imaging departments for images to be evaluated by clinical (non-radiological) staff.
- Arrangements should be agreed for the formal reporting on throughput so that there is timely monitoring of demand and capacity.

4.2.34 On 26 August 2010, the Chief Executive of the Western Trust wrote to the Chief Executive of the HSC Board in response to his letter of 13 August 2010. An update on the trust action plan was provided which indicated that:

- The chest x-ray target had been achieved except for seven reports on two patients.
- Most of the non-orthopaedic x-rays in the backlog had been sent to the independent sector provider with additional in-house reporting for the remainder.
- It had been agreed that all outstanding orthopaedic x-rays would be reported.

4.2.35 On 27 August 2010, at the Western Trust Performance Management meeting with the HSC Board, the trust advised that the outstanding plain x-rays would be reported in line with the timescales set out in the HSC Board letter of 13 August 2010.

4.2.36 On 6 September 2010, the final report on the SAI of 28 July 2010 was received by the HSC Board from the Western Trust.

4.2.37 On 1 October 2010, at the Western Trust Performance Management meeting with the HSC Board, the trust reported that all chest x-rays had been reported. In relation to the remaining unreported x-rays there were technical difficulties preventing the trust accessing these. Options to overcome these difficulties were being examined. The HSC Board noted that the deadline for reporting these x-rays had now passed and asked the trust to submit a final report by 15 October 2010.

4.2.38 By 21 October 2010, all x-rays in the Western Trust identified backlogs had been reported.

4.2.39 On 21 October 2010, PHA contacted the RCR to follow up the request for a review. RCR advised that its Service Review Committee had considered the documentation provided by the HSC Board and had spoken to the lead clinician at Altnagelvin Hospital. The assessment of the Service Review Committee was that the backlog had not arisen because of behavioural issues which fall within the remit of the committee and that the trust action plan demonstrated that the trust was dealing with the issue. The Committee had not therefore agreed to carry out a review.

4.2.40 On 29 October 2010, Professor Philip Gishen, Director of Imaging at Imperial College Healthcare NHS Trust London was asked by the HSC Board and PHA to lead a service review of radiology services in the Western Trust and given terms of reference.

4.2.41 On 5 November 2010, at the Western Trust Performance Management meeting with the HSC Board, it was noted by the HSC Board that the final report on the management of the backlog had not yet been submitted by the Western Trust.

4.2.42 On 11 November 2010, the Chief Executive of the HSC Board wrote to the Chief Executive of Western Trust confirming that a review of radiology services in the trust would be led by Professor Philip Gishen on 29 and 30 November 2010.

4.2.43 On 16 November 2010, the DRO for the SAI from 28 July 2010 advised the Regional SAI Review Group that the urgent details of the SAI had been addressed but that the incident would remain open pending further investigation into the wider implications.

4.2.44 On 24 November 2010, the HSC Board formally followed up with the Western Trust, as an outstanding action, the fact that the closure report on the management of the backlog had not yet been received.

4.2.45 On 26 November 2010, the Chief Executive of the Western Trust wrote to the Chief Executive of the HSC Board enclosing a copy of the closure report dated 21 October 2010 and apologising that this had not been forwarded earlier. The closure report set out the position that, at 21 October 2010, no plain x-rays were waiting for over 28 days to be reported.

The closure report stated that clinical staff had advised that 4 patients (including one of those referred to under the SAI of 28 July 2010) had been identified as having a delay in their diagnosis.

4.2.46 On 29 and 30 November 2010, a team led by Professor Philip Gishen visited the Western Trust to carry out a review of radiology services.

4.2.47 On 9 and 10 December 2010, Directors of the HSC Board and PHA visited the Western Trust to carry out a wider performance review process.

4.2.48 On 31 December 2010, a report entitled "Imaging Review at the Western Health and Social Care Trust, December 2010" (the Gishen Report) was issued by Professor Gishen to the HSC Board and PHA. The review made recommendations for short term and long term actions. The review stated that the problem of unreported plain films had been adequately dealt with and that the appointment of more radiologists and three-yearly review of staffing levels should ensure that this does not occur again. The review reached the following conclusions:

- "Staffing levels have not increased to maintain increased workload. Lack of radiologists does not provide resilience.
- Lack of equipment does not provide resilience.
- Accommodation (space) is dated.
- Lack of recurrent funding resulted in inability to recruit proactively.
- Radiology service is seen as a cost pressure to the organisation.
- There is lack of integrated working among staff from the different sites.
- Having worked prolonged hours, staff feel exhausted following the correction of the unreported incident.
- The management structure is not fully embedded."

4.2.49 On 26 January 2011, the Gishen Report was provided to the Western Trust.

4.2.50 On 27 January 2011, the Chief Executive and the Medical Director of the Western Trust attended a meeting of the Board of the HSC Board at which the wider review of performance was discussed.

4.2.51 On the evening of 27 January 2011 and during subsequent days there was significant media coverage that four patients had received a late diagnosis of cancer as a result of a large backlog in dealing with x-rays. The Western Trust issued a media statement on 27 January 2011 referring to both the HSC Board performance review which had been discussed at the meeting of the HSC Board earlier that day and the reporting of x-rays at Altnagelvin Hospital.

4.2.52 On 3 February 2011, the Medical Director of the Western Trust wrote formally to three of the four patients affected having previously met one of the families of the affected patients. The Medical Director offered apologies on behalf of the trust. Further meetings with family members took place during February and March 2011.

4.2.53 On 3 February 2011, The Western Trust Chief Executive, Medical Director and Lead Clinician attended a meeting of the Health Committee and briefed the committee on the backlog.

4.2.54 On 8 February 2011, the Gishen report was presented to the HSC Board Senior Management Team by the Director of Public Health and arrangements put in place to follow up on the recommendations both for the trust and the region in general.

4.2.55 On 10 February 2011, the Chief Executive of the HSC Board wrote to the Chief Executives of all trusts asking them to confirm their position on unreported plain x-rays.

4.2.56 On 10 February the General Medical Council wrote to the Western Trust Medical Director following the review undertaken by the HSC Board into radiology services in the trust and seeking assurance that the trust did not have any concerns about any individual practitioners involved. The Medical Director replied on the following day advising that she did not have concerns about any individual practitioners as a result of the delayed reporting and subsequent investigations of these matters.

4.2.57 On 25 February 2011, the Chief Executive of the HSC Board wrote to the Trust Chief Executives to establish a regional working group on radiology following the review of radiology services at the Western Trust.

4.2.58 On 4 March 2011, the Chief Executive of the Western Trust wrote to the Chief Executive of the HSC Board in response to his letter of 10 February 2011. She advised that the trust was committed to ensuring that there would be no further backlog of reporting plain x-rays. She stated that the trust would welcome the opportunity to discuss the implementation of the Gishen Report as the current performance was only being maintained on the Altnagelvin Hospital site with significant effort on the part of the medical imaging staff, including the employment of locum radiologists. She set out the arrangements for

monitoring which had been put in place to ensure that no patient waited longer than two days for reporting of an urgent x-ray and no longer than 28 days for a routine x-ray.

4.2.59 On 21 March 2011, the HSC Board convened a workshop on "Modernising Radiology in Northern Ireland" chaired by the Chief Executive.

4.2.60 On 29 March 2011, a Western Area Imaging Review Working Group was established to take forward the key local issues identified in the Gishen Report.

4.3 Factors Leading to Delays in Reporting Plain X-rays

4.3.1 The review team found that the most significant factor leading to delays in reporting of plain x-rays at Altnagelvin Hospital in the Western Trust during the period from June 2008 to October 2010 was a major shortfall in the availability of consultant radiologists. During this period the Erne and Tyrone County Hospitals in the trust continued to report on plain x-rays without delay.

In June 2008 two consultant radiologists retired who had previously reported on 44 per cent of the plain x-rays at Altnagelvin Hospital. Over the next 18 months the number of vacancies gradually increased to a highest level of 5 WTE of the 13 WTE posts in December 2009. Periods of sick leave and study leave made the position worse.

During 2010, the position improved through the recruitment of locums. By October 2010, there were seven substantive and five locum consultants in post out of a funded establishment of 13 posts. The trust did seek to recruit additional doctors but with limited success during this period.

4.3.2 The review team found that a factor which contributed significantly to the delay in reporting was an increase in the number of plain x-rays which required to be reported. This was due both to a general increase in workload at Altnagelvin Hospital and, in particular in May 2008, to the introduction of Computed Radiography (CR) and digital archiving of all these digitally acquired x-rays at Altnagelvin and Roe Valley Hospitals. Between 2007 and 2009, the number of plain x-ray examinations increased by 8.7 per cent. The introduction of CR and a digital x-ray archive was estimated to have increased the number of plain x-rays to be reported by a further 15-20 per cent. Previously these x-rays had not been returned to the radiology department for reporting. This is a recognised and predictable by product of introducing a PACS system and is not exclusive to the Western Trust.

4.3.3 The review team was advised by the trust that a further factor contributing to the backlog was that performance targets for radiology at that time were set for the modalities of CT, MRI, US but not for plain

x-rays. Pressure to achieve the targets led to prioritisation of these modalities over plain x-rays. Radiologists advised the review team that this did lead to interruptions to plain x-ray reporting sessions when they were urgently called upon to report on other types of imaging studies, so that these targets would not be breached, thus reducing their productivity in plain x-ray reporting during the sessions. Having recognised this problem the trust put in place measures to seek to reduce the number of interruptions including swipe card access to the radiology reporting rooms.

4.3.4 During the period when there were delays in reporting, there were ongoing changes in key leadership roles relating to the radiology department. In September 2008, the Divisional Clinical Director (Diagnostics) left to take up a different post and, although it was advertised eight times, the post remained unfilled. Between November 2008 and April 2010 there were three different Directors of Acute Hospital Services. Between 2007 and 2010 there was a trust-wide Lead Clinician for Radiology who stepped down in May 2010 and two site specific leads were appointed. The review team considers that the changes in leadership over this period are likely to have impacted on the ability of the trust to respond effectively to the challenges facing the radiology department. The lack of consistent leadership for radiology would have worked against a cohesive response from all the imaging departments within the Western Trust to the emerging backlogs.

4.3.5 In May 2010, NIPACS went live within the Western Trust. The trust had already experienced the increased workload associated with the introduction of a RIS and a separate PACS in May 2008. The introduction of NIPACS did require a significant input of time from members of the radiology department in preparing for, implementing and customising the new system and this also impacted adversely on the amount of time available for reporting.

4.3.6 During the period from June 2008 to October 2010 the radiology department at Altnagelvin did not change the reporting policy for plain x-rays and continued to accept responsibility for reporting on 95-97 per cent of plain x-rays.

4.4 The Response to Delays in Reporting Plain X-rays

4.4.1 The review team found that throughout the period when there were delays in reporting plain x-rays, the Western Trust sought to address the problem with a range of measures.

4.4.2 From June 2008 to December 2008, retired radiologists were employed on a sessional basis to report x-rays. From December 2008 onwards, trust radiologists were employed to carry out additional sessions of reporting. Numerous attempts to recruit radiologists on a permanent or temporary basis had limited success. In March 2009, radiologists from

Erne and Tyrone County agreed to carry out reporting sessions on the Altnagelvin site.

4.4.3 The introduction of CR appeared to offer opportunities to transfer x-rays to the southern sector of the trust but these were not successful. An initial attempt between February and June 2009 to send images electronically failed as the two different PACS in place at that time were not compatible. In March 2009, the radiology department borrowed two PACS workstations from the Northern Trust with the aim of placing these in Erne and Tyrone County to send images from Altnagelvin. This was not a practical solution as it took 20 minutes to transfer a single study.

4.4.4 The Western Trust did receive some support from other trusts to help Altnagelvin radiologists; Belfast Trust radiologists went to Altnagelvin to support Nuclear Medicine and cardiac image reporting.

4.4.5 In September 2009, proposals were developed to outsource x-ray reporting to an independent sector provider. It took several months to identify funding, agree a contract and to overcome technical issues. The first x-rays were sent to the provider in March 2010.

4.4.6 While continuing to accept responsibility for the reporting of over 95 per cent of plain x-rays, the radiology department introduced prioritisation arrangements based on the source of the request for x-ray. Requests from Accident and Emergency, GPs and x-rays identified as urgent by radiographers received the highest priority followed by inpatient requests. Outpatients and Orthopaedic requests were the lowest priority groups. In August 2009 turnaround times for the three highest priority groups were 1-5 days with routine orthopaedic x-rays waiting over six months to be reported.

4.4.7 In March 2010, a recently seconded Acting Director of Acute Hospital Services raised the possibility that the trust should establish a policy that a greater proportion of plain x-rays would not be reported by radiologists but interpreted by other consultants. This was not taken forward.

4.4.8. In July 2010, following the reporting of two incidents, the trust escalated the response to the problem, and an incident team was established to manage the situation. The backlog was addressed during the period to October 2010 through increasing the level of reporting, both by trust radiologists (when in July 2010 there was a full complement in post) and through the independent sector. The response to the backlog at this time was also facilitated through the availability of NIPACS across the trust.

4.4.9 The HSC Board was advised of the problems with recruitment of radiologists in December 2009 and sought assurance as to the measures in place to mitigate the effects.

4.4.10 In July 2010, following the receipt of an SAI from the trust, the HSC Board and PHA sought urgent clarification of the position and targets were set for the backlog to be addressed. The HSC Board established an external review of the circumstances leading to the delays in reporting and the recommendations of that review are being taken forward through an Imaging Services Review Group.

4.4.11 Issues relating to the backlog in reporting were included on the Acute Services Directorate risk register and reported at the trust Integrated Clinical and Social Care Governance Committee. In July 2010, following the reporting of the incidents, the risk was escalated to the Corporate Risk Register.

4.4.12 During the investigation into the incidents reported in July 2010, it was found that a report on a patient provided by the independent sector had not been red flagged and this contributed to a further delay in diagnosis for a patient. This was appropriately followed up by the Western Trust Medical Director with the company, who carried out an internal investigation which revealed that this was an omission by the independent sector radiologist who had reported the x-ray and who accepted that the report should have been red flagged.

4.5 The Impacts of Delays in Reporting for Patients

4.5.1 The RQIA review team was advised by the Western Trust of four cases in which a delay in reporting of a plain x-ray had contributed to a delayed diagnosis for the patient during the period from August 2009 to October 2010. The review team discussed these cases with clinical and radiological consultants and reviewed the response to the reporting of the incidents.

4.5.2 In the first case, a patient was admitted to Altnagelvin Hospital in August 2009 and had a chest x-ray taken as part of a range of investigations. The chest x-ray was returned to the ward. There is no record that it was evaluated by a doctor at that time. The chest x-ray was reported in March 2010 by a radiologist working for the independent sector provider and a possible lung cancer identified. The radiologist did not red flag the report in line with the agreed protocol (see 4.4.12) and the report was not forwarded to the acute ward until July 2010. A junior doctor immediately arranged for follow up when she saw the report on 7 July 2010. The patient's consultant brought the incident to the attention of the radiology department expressing his serious concern about the situation (see 4.2.16).

4.5.3 In this case, an initial delay of 8.5 months in reporting a chest x-ray, followed by a further three month delay in the report being acted upon, delayed a diagnosis of lung cancer and the potential for initiating treatment by almost one year.

4.5.4 In the second case, a GP referred a patient in August 2009 in relation to chronic lung disease. The patient was seen by a consultant in November 2009 and a chest x-ray was taken. The consultant viewed the x-ray at the same outpatient clinic. On review of the case the consultant considers it is possible that the wrong x-ray was viewed at that time. The x-ray was reported four months later in March 2010 by the independent sector provider. The report of the chest x-ray was not definitive as to a diagnosis with an abnormality identified which may have been the result of "recent infection or infarction". It was not red flagged. The report was received by the consultant in July 2010 who wrote to the patient's GP describing the findings on the x-ray and enquiring about the patient. A partner in the GP practice replied advising that the patient had not been seen recently by a doctor in the practice. In September 2010 a GP from the practice wrote to advise the consultant that the patient had respiratory symptoms and an urgent chest x-ray had been arranged. The abnormality on the chest x-ray was still present when it was reported within four days of referral. Following further investigation, the patient was diagnosed with lung cancer.

4.5.5 In this case, there was a delay of four months in reporting a chest x-ray for an outpatient and a further delay of over three months in the report of the x-ray being brought to the attention of the consultant who had requested it. The findings of the x-ray were not definitive and not red flagged. The patient was referred back as a result of symptoms and an urgent x-ray was then reported on rapidly, and led to a diagnosis of cancer. For this patient, it is not clear whether an earlier report of the chest x-ray would have led to an earlier diagnosis, as the correct diagnosis was only made when the patient was referred back in September 2010 with symptoms and when the result of the subsequent chest x-ray was known. The review team considers that this case does represent a discrepancy in reporting as defined at section 2.3.1.

4.5.6 In a third case, a patient was urgently referred for investigation of neurological symptoms to an outpatient clinic in December 2009. A chest x-ray was performed when the patient attended a clinic in January 2010. The patient had further investigations and attended outpatients again in May 2010 when it was noted that the chest x-ray had not been reported. The chest x-ray was reported by the independent sector provider in August 2010 and was red-flagged due to a "faint rounded opacity" which was identified. This report was immediately escalated to a respiratory physician by the Radiology Incident Review Team which had been established. The patient was subsequently diagnosed with lung cancer.

4.5.7 In this case, there was a seven month delay in reporting of a chest x-ray leading to a delay in a diagnosis of cancer for a patient. The report of the x-ray was red flagged and acted upon when it was received by the trust.

4.5.8 The fourth case was a patient who attended the outpatient department for investigation of arthritis in January 2010. A chest x-ray was requested as part of routine investigations and performed on the same day. The patient attended a planned review in May 2010. There is no record of the consultant having viewed the x-ray at that visit, although it would be the consultant's normal practice to do so. The x-ray was reported by the independent sector provider in August 2010 and a faint abnormality was identified which it was stated "is unlikely to represent any significant pathology". The x-ray report was discussed by the patient's consultant with Altnagelvin radiologists and it was decided to request CT of the lungs for further investigation. The patient was subsequently diagnosed as having lung cancer.

4.5.9 In this case, there was a seven month delay in reporting of a chest x-ray for a patient in whom subsequent investigations led to a diagnosis of lung cancer. When the chest x-ray was reported by a consultant radiologist an abnormality on the x-ray was not identified as a possible lung cancer. The review team considers that the case meets the definition of a reporting discrepancy as set out at 2.3.1.

4.6 Communication with Patients and Families

4.6.1 RQIA staff met with two bereaved families who had experienced delays in the reporting of a relative's radiological investigations. The following is a combined account of the experiences they shared at the meetings.

4.6.2 Both families stated that their decision to share their experiences with RQIA was influenced by their understanding that lessons would be learned to improve future care provision. RQIA recognises that this was a very difficult subject to discuss and wishes to thank all those involved for their participation, openness and willingness to share their experience.

4.6.3 General Practitioners (GPs) made the initial contact with each patient following the identification, by the trust, that there had been a delay in reporting of chest x-rays. Families advised that in each case the GP asked the patient to re-attend the hospital for further x-rays without giving any further explanation as to why these were required.

4.6.4 One family was informed, by the hospital, that there would be a long wait at the x-ray department and as a consequence the family made an appointment for the following week. The GP subsequently visited the patient's house and prompted the patient to attend immediately but did not provide an explanation for the urgency.

4.6.5 Both families advised the review team that, given the long period since the initial x-rays were taken, they felt that they should have been given more information at this stage to explain why an urgent re-referral was required.

4.6.6 Both patients attended for further investigations which confirmed diagnoses of lung cancer. A family member of one patient was informed of the diagnosis of cancer, by the patient's GP, by telephone. The family considered that this information should have been conveyed in person.

4.6.7 Both families perceived that staff were holding back information regarding the circumstances relating to the delay in reporting, and the possible implications for treatment of the patient.

4.6.8 Members of each family subsequently met with the consultant responsible for the patient's ongoing treatment and care. One family recalled that they were told that there had been a backlog of x-rays as a result of understaffing. They do not recall a specific apology being given at that time for the delay in diagnosis. The other family recalled being told there was a problem with the records and in retrospect felt they should have been given more information about the delays at that time.

4.6.9 Each family discussed, with the consultant, the prognosis and the treatment options available. For one patient the family understood initially that chemotherapy, radiotherapy and surgery were all possible treatments which they found hopeful. Following a subsequent MRI investigation, the consultant advised that only one option was appropriate for the patient which the family found distressing.

4.6.10 Both families said that they did not appreciate the full extent of the spread of the disease. With hindsight they considered that neither patient was offered appropriate levels of pain relief or symptom management prior to the diagnosis. Both families expressed their feeling of guilt, as they felt they had not been aware of the full extent of the suffering experienced by their relative.

4.6.11 Both families described circumstances which they considered demonstrated poor communication between both the trust departments and the staff involved in the care of their relatives after the delayed diagnoses were made.

4.6.12 One family described confusion in relation to an outpatient appointment. The patient had been asked to attend an appointment with the consultant. On arrival the consultant was not available and there was no record of this appointment leading to uncertainty as to where the patient should be seen that day.

4.6.13 One family described a sequence of events after their relative suffered a hip fracture. The family highlighted issues with the care of the patient during this period including delay in the diagnosis of the hip fracture and patient notes not being available which could have resulted in cancellation of surgery. There had been concerns over the ability of this patient to cope with invasive surgery for cancer. However, the

successful outcome of the hip fracture surgery led the family to believe that if a timely diagnosis had been made and surgery, to remove the lung cancer, had been offered at an earlier stage that the outcome could have been successful.

4.6.14 Retrospectively, both families indicated that, had they been made aware of x-ray examinations being undertaken, they would have pursued the results more actively. Families questioned why, when a decision had been taken to order an x-ray, there was no evidence that the consultant who had ordered the investigation had followed up the lack of a report.

4.6.15 One family advised that trust staff attended the wake following the death of their relative. The family had felt this was inappropriate at a very difficult time for them.

4.6.16 The families described their reactions and feelings to the significant media coverage of the delays in reporting at Altnagelvin Hospital. Both families found the media coverage to be very distressing and felt that the trust should have advised them about potential media interest before the story was reported. When the story was reported on the television news, one patient recognised that the story related to them and this was very emotionally distressing.

4.6.17 On the evening when the delays were reported in the media, a senior representative of the trust was interviewed on the evening news. The families advised that this staff member stated that the affected families had been advised of the incident and had received an apology from the trust. The families who spoke to RQIA indicated that this was not the case. The following day, a member of one of the families made a media response to the trust television interview, indicating that an apology had not been received.

4.6.18 For one family the media coverage occurred shortly after the death of their relative. The family reported media approaches to neighbours, a clergyman and the undertakers in the weeks after their bereavement. One family member was contacted directly on their mobile phone by the local radio station. The family found these approaches intrusive.

4.6.19 Families received a letter from the trust approximately one week after the television interview. The families spoken with had differing feelings on this letter; one felt it was sympathetic and the other felt it offered no apology.

4.6.20 After these events the Chief Executive of the Western Health and Social Care Trust offered to meet with those families involved. At the time of the meeting with RQIA, for one family this meeting had taken place and the other had been arranged and subsequently cancelled by the trust. This was being rearranged.

4.6.21 RQIA staff asked the families what they felt could be learned from their experiences to improve future care provision and communication by the trust. The families stated that if a problem is identified it should be handled in an immediate and transparent way. They believed that lessons must be learned from this incident to prevent other families experiencing such delays in the future. The families considered that honesty, integrity and timeliness should be the values adopted when such incidents occur.

Section 5: Conclusions and Recommendations

5.1 Factors Leading to Delays in Reporting

5.1.1 The review team has concluded that the three main factors contributing to delays in reporting plain x-rays in the Southern Trust during 2010 and up to March 2011 were: a shortfall in consultant radiology staffing, a growth in numbers of x-rays to be reported after the introduction of NIPACS and the introduction of a new policy to report on all hospital chest x-rays in response to concerns about patient safety. The number of x-rays to be reported, following the allocation of funding for elective care late in the financial year, increased the size of the backlog.

5.1.2 The review team has concluded that the most important factor leading to delays in reporting of plain x-rays at Altnagelvin Hospital in the Western Trust from mid-2008 to October 2010 was a major shortfall in numbers of consultant radiologists due to unfilled funded posts. Other important contributing factors were increased numbers of x-rays for reporting following the introduction of NIPACS, a general year on year increase in x-ray investigations and the prioritisation of other types of radiological examination, which had regional targets for reporting time, over plain x-rays.

5.1.3 A common factor for both trusts was the difficulties they faced in recruiting consultant radiologists to vacant posts on a permanent or locum basis. The review team recommended following Phase 1 of this review, that a new workforce plan should be developed for radiology in Northern Ireland. In the light of the findings of Phase 2, it is recommended that a regional escalation plan should be in place to support any trust which is unable to sustain reporting levels due to an inability to recruit radiology staff. With the introduction of NIPACS it is now possible for all hospitals linked to NIPACS to report on images taken at any hospital in Northern Ireland.

5.1.4 In both trusts the introduction of Computed Radiography and a digital archive generated a significant increase in the number of plain x-rays to be reported (as has been widely documented worldwide in sites where digital technology has been introduced). There were important differences in the process whereby this was introduced. At Altnagelvin Hospital an interim step to introduce PACS and RIS took place in 2008 before NIPACS in 2010, and thus the radiology department there was faced from that time with the additional reporting of x-rays. In the Southern Trust, NIPACS was introduced in 2010.

5.1.5 Both trusts reported a general increase in the number of plain x-rays to be reported which contributed to the size of backlogs. In the Southern Trust the allocation of funding for elective work late in the 2010/11 financial year increased the demands on the radiology department at the time when a significant reporting backlog was growing.

5.1.6 Each trust advised the review team that a lack of a regional target for plain x-rays before 2011 impacted upon priorities for reporting. Nevertheless, there is clear evidence that each trust took steps to seek to address backlogs including the allocation of additional resources.

5.2 Reporting Policies for Plain X-rays

5.2.1 The review team found that the policies in the two trusts as to which plain x-rays received a routine radiological report were different.

5.2.2 In the Southern Trust plain x-rays requested for hospital A&E patients and inpatients did not receive a routine report from a consultant radiologist at the start of 2010. Concerns were raised about the risks associated with not reporting chest x-rays and routine reporting of these began in August 2010 including all chest x-rays taken from April 2010. The review team supports this policy change although the decision contributed to the delays in reporting.

5.2.3 In the Western Trust the policy is to provide a report on over 95 per cent of plain x-rays and this was maintained throughout the period of the delays.

The prioritisation policy at Altnagelvin Hospital during the period of the delays was based upon the origin of the x-ray. Orthopaedic films were allocated the lowest priority, since it was felt that orthopaedic surgeons could be relied upon to review the x-rays they requested since they need to evaluate them to guide patient management, and because it is unlikely that serious unsuspected pathology will present on orthopaedic follow-up plain x-rays, followed by other outpatients. A&E and GP requests were allocated the highest priority. A large proportion of the delayed x-rays were for outpatients and in particular for orthopaedic outpatients. The review team considers that, with hindsight, it would have been appropriate to allocate a high priority for all chest x-rays, regardless of who had requested them, based upon the increased risk of a chest x-ray showing an unsuspected, potentially treatable, lung cancer.

5.2.4 The review team considers that a standard policy for reporting of plain x-rays should be put in place across Northern Ireland, so that there is equality for patients, and so that it is clear to all staff which plain x-rays will receive a report from a radiologist. The review team recommends that all chest x-rays be reported by a radiologist.

5.3 The Response to Delays in Reporting

5.3.1 The review team has concluded that the Southern Trust identified a backlog in reporting at the time of the introduction of NIPACS, and responded appropriately to ensure that there were reports generated on NIPACS at that time. The Southern Trust responded to clinical concerns about non-reporting of hospital chest x-rays by funding their

inclusion in the radiology reporting policy. The full impact of this decision at a time of increased reporting requirements associated with NIPACS, and of additional hospital activity, was not initially realised. When the Chief Executive was made aware, in late January 2011, that the backlog was not being contained, additional funding was made available to address it and an external contract established. The backlog was then addressed over a six week period.

5.3.2 The review team has concluded that over a period of two years from mid- 2008 onwards the Western Trust put in place a series of actions designed to address delays in plain x-ray reporting including additional reporting by trust radiologists and establishing an external contract. However, the measures put in place were not sufficient to deal with the steadily worsening situation in relation to the number of consultant radiologists in post at a time when the demands for x-ray reporting were increasing. Innovative approaches to increasing capacity by attempting to utilise equipment borrowed from other trusts to facilitate reporting by consultant radiologists in Erne and Tyrone County Hospitals proved technically unfeasible.

5.3.3 In July 2010, following the reporting of two clinical incidents, the Western Trust became acutely aware at executive level of the risks to patients as a result of the backlog, particularly for delays in reporting chest-rays. An Incident Team was established, led by the Medical Director, and an action plan developed to address the backlog as rapidly as possible. Chest x-rays were prioritised for reporting and all plain x-rays were being reported within 28 days. The speed with which the backlog was able to be tackled at this time was facilitated by three important factors. A full complement of radiologists was then in post. NIPACS had gone live across the trust in May and June 2010 allowing images to be transferred across the trust. Established arrangements were in place to allow plain x-rays from the backlog to be sent to an external provider for reporting.

5.4 The Impact of Delays for Patients

5.4.1 The review team considered three cases in the Southern Trust in which there was a delay in diagnosis of cancer, potentially linked to a delay in reporting of an x-ray. In the first case the primary cause of the delay was not due to a general backlog in reporting of x-rays, but to an administrative error in the manual system for bringing hard copy x-rays in priority order for reporting to consultant radiologists. This risk was eliminated with the introduction of computed radiology, which replaced hard copy analogue x-ray film with soft copy digital x-ray images displayed on monitors, when NIPACS went live. In the second and third cases there were delays of between 2 and 4.5 months in reporting chest x-rays during the period after the trust's decision to report on all hospital chest x-rays. The review team was advised that the clinical view is that the delays in the reporting of these two cases were not detrimental to the patients' treatment and care.

5.4.2 The review team considered four cases in the Western Trust which had been identified where there was a delay of between seven and 11.5 months in the diagnosis of cancer. In two cases delays in reporting of chest x-rays were followed by three month delays in bringing the reports to the attention of the clinical teams who had requested the x-rays. In one of these cases there was an error, by a radiologist in the independent sector reporting service employed by the trust, in not following "red flag" procedures at the time of reporting. In two of the four cases the review team considers that discrepancies in reporting, rather than delays in reporting were the important factor in leading to delays in diagnosis. The review team was advised that the delays or discrepancies in reporting may have delayed the start of treatment in these four cases.

5.4.3 The review team considers that the events which occurred in these seven cases provide key learning points for reducing risks to patient safety.

i. All cases involved delays or discrepancies in the reporting of chest x-rays reinforcing the need for systems to be in place for timely reporting by radiologists for all chest x-rays.

ii. In one case, the failure to apply a "red flag", when this was required by protocol led to a further delay of three months in a diagnosis of cancer being made. The review team recommends that all providers should review systems to prioritise action on abnormal radiology results to ensure that these are working effectively.

iii. In two cases, the failure to distribute results of investigations rapidly back to referring consultants contributed to delays in acting upon the findings. There is a need to ensure that there are effective systems in place for the dissemination of results and for documented, auditable feedback that these results have been received, and acted upon.

iv. In one case, which was not directly related to the backlog in reporting, a manual system for allocating priority for reporting was not followed. All systems for record handling which impact on the priority with which patients are seen, or investigations are reported, should be regularly audited to ensure that agreed procedures are being followed.

v. Actions by doctors to report incidents and to follow up on abnormal results prevented further delays in diagnosis both for their own, and other patients. Radiology departments should review their arrangements to ensure that other consultants and junior doctors are encouraged and facilitated to discuss any concerns they have about the reports of x-ray examinations.

5.5 Communication with Patients and their Families

5.5.1 The review team considers that there are important lessons about communication with patients and families from the experiences described to the review team by families affected by delays in reporting of plain x-rays.

5.5.2 Families felt that the initial contact with patients to ask them to return for further investigations, several months after an x-ray had been taken, should have been directly from trust staff and not via their GP. They felt it would have been appropriate for the trust to contact the patients and their families directly giving an open and transparent reason as to why it was necessary to return for further investigations. The lack of clarity about what had occurred led one family to delay booking an appointment until they were contacted again.

5.5.3 The review team considers that, given the delays which had occurred, specific arrangements could have been put in place to contact patients directly and arrange for them to have immediate access to the further investigations they required.

5.5.4 The review team recommend that procedures for informing patients about the results of x-rays which require urgent follow up should be reviewed and standardised across all trusts in Northern Ireland.

5.5.5 Families were not always aware that a chest x-ray had been taken and advised the review team that, had they been made aware that x-ray examinations had been undertaken for their relative, they would have pursued the results more actively. The review team consider that these findings emphasise the need for all patients to be provided with a leaflet setting out how they will receive the results of x-ray examinations which was a recommendation of Phase 1 of this review.

5.5.6 The media focus on the delays in reporting was distressing and intrusive for families in the Western Trust who did not feel the content of the coverage represented the situation as they had experienced it. They were unprepared for the situation when the story was reported.

5.5.7 The review team found that the media reporting of the issues in relation to x-ray reporting placed the trusts in reactive positions and for the Western Trust provided little time to respond. The impact on the families who spoke to the review team was very significant even though they were not named by the trust in the media. The review team considers there is a need to develop guidance for all HSC organisations to follow in relation to providing information and assistance to patients, families and staff if they are impacted by media coverage of an incident which involved them directly.

5.6 Regional Communication Arrangements

5.6.1 In July 2010, the Western Trust reported two clinical incidents as an SAI to the HSC Board, in keeping with new reporting arrangements which had been put in place on 1 May 2010 when the responsibility for SAIs transferred from DHSSPS to the HSC Board. The HSC Board, in partnership with the PHA followed up the incident and there was active follow up of progress in tackling the backlog. The HSC Board commissioned an external review of radiology services at the Western Trust.

5.6.2 In August 2010, the HSC Board sought assurance from other trusts as to their position in relation to delays in x-ray reporting. The Southern Trust advised that they had a small backlog which was being addressed. At that time, the Southern Trust had just commenced additional reporting sessions associated with the reporting of hospital chest x-rays and was not aware that a significant backlog was to develop over the next few months. In February 2011, the Southern Trust advised DHSSPS and the HSC Board when an email, from an unidentifiable source, was sent to politicians and the media about radiology reporting in the trust.

5.6.3 The review team has concluded that, at regional level, there was no clear awareness of the growing delays in plain x-ray reporting during the periods when the backlogs were building up. The review team considers that this lack of awareness was contributed to by several factors.

5.6.4 During the period up to March 2011, there were no regional targets for plain x-ray reporting although there were for other types of radiological examination. Routine reports on waiting times for plain x-rays were therefore not being provided to the regional level which would have indicated delays in reporting. The HSC Board has advised that information is now routinely collected for plain x-rays which should identify any emerging delays in the future.

5.6.5 The arrangements for reporting SAIs changed during the period in which delays were growing (section 2.6 above). On 1 May 2010 the responsibility was transferred from DHSSPS to the HSC Board and the criteria for reporting were changed. An incident in the Southern Trust did not meet the criteria for reporting to DHSSPS at the time it was identified in January 2010. From May 2010 this incident could have been considered for reporting under the new criteria, under the category: “unexpected serious risk to a service user and/or staff member and/or member of the public”. Under the new arrangements this would have been shared with members of a regional group which oversees the SAI reporting system.

5.6.6 In the Western Trust an SAI was reported to the HSC Board under the new arrangements in July 2010 after two clinical incidents were

reported within the trust. This brought the issue to the attention of the HSC Board and PHA and the SAI was actively followed up with weekly audit put in place to monitor the process of elimination of the backlog.

5.6.7 Trust governance staff advised the review team that it would be useful to review the new SAI reporting criteria in the light of experience of reporting since 1 May 2010 to ensure consistency of reporting SAIs.

5.6.8 The review team found that both the Southern and Western Trusts have risk registers in place at corporate, divisional and directorate levels. Issues associated with delays in reporting were placed on risk registers and escalated when the situation deteriorated. The risk registers were therefore a potential source of intelligence to identify that problems were occurring in more than one trust. Trusts advised the review team that risk registers are not routinely shared at any level between trusts or with the HSC Board.

The Southern Trust Chief Executive advised that she does, now, bring the risk register to share at accountability meetings with the HSC Board. The HSC Board advised the review team that it is now routine practice for all trusts to be asked to report any significant issues or concerns at regular meetings with chief executives. Nevertheless, the review team considers that the routine review of risk registers across trusts at corporate and potentially divisional levels could provide early warning of emerging issues which have not yet been escalated to be considered at regional level.

5.6.9 Inability to recruit consultant radiologists to funded posts was a very significant factor in leading to delays in reporting of plains x-rays in both trusts. The review team was advised that previous arrangements for carrying out an annual assessment of the radiology workforce ceased when the Specialist Advisory Committee was stood down some years ago. A paper was prepared by DHSSPS each year reviewing the workforce to inform the recruitment of trainee doctors. The review team was advised by trusts that there is no routine system in place through which they inform regional bodies as to current or emerging recruitment problems. In Phase 1 of this review it was recommended that a regional workforce plan for radiology should be developed. In the light of the findings of Phase 2, it is recommended that a system is established to collect and collate information on emerging workforce issues across trusts which could adversely impact on service delivery.

5.7 Recommendations

5.7.1 The RQIA review team considers that there are important lessons for HSC organisations from this examination of the circumstances leading to delays in the reporting of plain x-rays and from the experiences of families who were affected by the delays. To this end, the review team has made 14 recommendations in this report to enhance patient safety and to improve communication with patients and families.

1. A regional escalation plan should be in place to support any trust which is unable to sustain plain x-ray reporting levels due to an inability to recruit radiology staff.

2. A standard policy for reporting of plain x-rays should be put in place across Northern Ireland so that there is equity of reporting and it is clear to all staff as to which plain x-rays will receive a formal report from radiology. All chest x-rays should be reported by a radiologist.

3 All providers should review systems to prioritise action on abnormal radiology results, and to ensure that these are working effectively.

4 All providers should ensure that they have effective systems in place for the rapid dissemination of results of investigations to the clinicians/clinical teams who requested them with auditable feedback mechanisms to identify that the results have been received, read and acted upon.

5. All systems for record handling which impact upon the priority with which patients are seen, or investigations are reported, should be regularly audited to ensure that agreed procedures are being followed.

6. Radiology departments should review their arrangements to ensure that other consultants and junior doctors are encouraged and facilitated to discuss any concerns they may have about the reports of x-ray examinations.

7 The HSC Board and trusts should review the implementation of the new SAI reporting criteria put in place on 1 May 2010 to ensure that there is consistency of reporting of SAI's in the system.

8 The HSC Board and trusts should carry out a review of risk management arrangements to explore the potential to share risk registers at corporate and divisional levels, to determine if they could provide early warning of emerging issues which have not yet been escalated to be considered at regional level.

9 A regional system should be established to collect and collate information on emerging workforce issues across trusts which could adversely impact upon service delivery.

10 Each trust should review its arrangements for engaging clinicians to ensure that the benefits of NIPACS are maximised across the whole hospital system. NIPACS software can and should be customised for individual users, such that the graphic user interface (GUI) suits the category of user (e.g. clinician versus radiologist) and makes it more individually user-friendly.

11 Each trust should ensure that the policy on reporting plain x-rays setting out which x-rays will be formally reported by radiologists is disseminated to all staff requesting x-ray examinations including new members of staff.

12 When there is allocation of extra funding to support additional elective cases within a trust, any increase in demand for radiology services should be taken into account and budgeted for.

13. Procedures for informing patients about the results of x-rays which require urgent follow up should be reviewed and standardised across all trusts in Northern Ireland.

14. Regional guidance should be developed for all HSC organisations to follow in relation to providing information and assistance to patients, families and staff, if they are impacted by of an incident, which involved them directly.

Section 6: Appendices

Appendix A: Glossary of Terms

Adverse Incident	Any event that could have or did lead to harm, loss or damage to people, property, environment or reputation.
Computed Tomography (CT scans)	A diagnostic procedure that uses special x-ray equipment to obtain cross-sectional pictures of the body. The CT computer displays these pictures as detailed images of organs, bones, and other tissues.
Department of Health, Social Services and Public Safety	The Department has three main business responsibilities: • Health and Social Care (HSC), which includes policy and legislation for hospitals, family practitioner services and community health and personal social services; • Public Health, which covers policy, legislation and administrative action to promote and protect the health and well-being of the population; and • Public Safety, which covers policy and legislation for fire and rescue services.
Health and Social Care Board	The role of the Health and Social Care Board is to develop health and social care services across Northern Ireland and is broadly contained in three functions: • To arrange or 'commission' a comprehensive range of modern and effective health and social services for the 1.7 million people who live in Northern Ireland; • To work with the health and social care trusts that directly provide services to people to ensure that these meet their needs; • To deploy and manage its annual funding from the Northern Ireland Executive, to ensure that all services are safe and sustainable.
Health and Social Care Trust	An organisation which provides health and social care services to the Northern Ireland public. Services are provided locally and on a regional basis.
Magnetic Resonance Imaging (MRI)	A radiology technique that uses magnetism, radio waves, and a computer to produce images of body structures.
NIPACS	The Northern Ireland Picture Archiving and Communication System.

Picture Archiving and Communication Systems (PACS) and Radiology Information Systems (RIS)	An electronic system which enables radiology departments to store, rapidly retrieve and share digital x-rays, and their reports, within and between hospitals.
Radiographer	A professional trained to operate equipment concerned with the production and detection of radiation. Radiographers work in multidisciplinary teams led by radiologists, to achieve diagnosis and treatment.
Radiologist	A doctor who has made a special study of radiology. They carry out the more complex investigations and are responsible for the analysis of the images. They also perform procedures under imaging guidance to obtain samples for pathology and for treating some conditions.
Risk Register	A list of key risks that need to be monitored and managed. A Risk Register analyses risks and drives action to: • Reduce the likelihood of the risk occurring. • Increase the visibility of the risk. • Increase the ability to handle the risk, should it occur. • Reduce the impact of the risk, should it occur.
Root Cause Analysis (RCA).	The identification of factors or “root causes” which led to circumstances being investigated and the identification of lessons which can be applied to reduce the likelihood of these happening again.
Royal College of Radiologists	The Royal College of Radiologists is the professional body responsible for the specialty of clinical oncology and clinical radiology throughout the United Kingdom. Its role is to advance the science and practice of radiology and oncology, further public education and set appropriate professional standards of practice. The College also sets and monitors the educational curriculum for those training to enter the profession.
Serious Adverse Incident	Any event or circumstance that led, or could have led, to serious unintended or unexpected harm, loss or damage.
Ultrasound Scans (US)	A way of producing detailed pictures of the body using sound waves. A computer converts the information into a picture that is displayed on a television screen.
X-ray	A picture of the internal structures of the body produced by exposure to a controlled source of x-rays.

Appendix B: Recommendations from Phase 1 Overview Report

1. DHSSPS should develop a strategy for the future provision of imaging services in Northern Ireland which incorporates a new workforce plan for radiology.

2. All relevant HSC organisations should consider the establishment of a Northern Ireland Managed Clinical Network for radiology.

3. DHSSPS should review, and consider for adoption in Northern Ireland, the new standards from the Royal College of Radiologists for the reporting and interpretation of imaging investigations by medically qualified non-radiologists and teleradiologists.

4. There should be a common framework for evaluating and recording reports on plain x-rays within orthopaedic services across Northern Ireland.

5 All relevant HSC organisations should exploit the full potential of the integrated provision of RIS/PACS across Northern Ireland, including trust-wide (or Northern-Ireland wide) reporting lists for plain x-rays where these are not already in place.

6. A firm date should be agreed for the integration of PACS at the Belfast City and Royal Victoria hospitals with NIPACS.

7. The review team recommends that all trusts should review their arrangements for engaging and training clinicians across hospitals in taking forward NIPACS.

8. All trusts should put in place written agreements with clinical departments in which there are arrangements for the reporting of plain x-rays by non-radiologists or reporting radiographers. There should be signed agreements with each individual clinician in relation to this function.

9. All trusts should establish a programme of planned audits to provide assurance that there are written evaluations of any x-ray examinations, which do not have a report recorded on the trust RIS/PACS.

10. Trusts should establish written escalation procedures (where these are not in place) to reduce the risk of delays in plain x-ray reporting, setting out triggers and actions to be taken at clinician, departmental and organisational level.

11. A common leaflet should be available across Northern Ireland for patients setting out arrangements as to how and when they will receive the results of their x-ray examinations.

12. The review team recommends that the focus of Phase 2 of this review should include an assessment of the circumstances leading to delays in the reporting of x-rays in the Southern Trust during the period from 2010 to early 2011, and in the Western Trust from 2008 to 2010 and the actions taken to address those delays.

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