

# Local Data Repository

## Final Internal Audit Report

2024/25

Cardiff & Vale University Health Board



Limited Assurance

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# Executive Summary

## Purpose

To provide assurance over the arrangements in place for the development of the Local Data Repository (LDR).

## Background

The National Data Resource (NDR) is hosted by Digital Health and Care Wales (DHCW) and funded by Welsh Government. It is a national data platform that will link health and social care data sourced from local data repositories (LDR) across NHS Wales organisations and data from nationally hosted systems by DHCW.

In order to build a complete and accurate LDR, which in turn will become part of the NDR, currently held data within the health board needs to be made available and translated into a standardised format, thus making data interoperable.

In June 2023, Welsh Government formally mandated the Fast Healthcare Interoperability Resources (FHIR) as a foundational interoperability standard for all IT and all digital systems / services. The framework was created by the Health Level Seven International (HL7) healthcare standards organisation and encompasses standards for the exchange, integration, sharing and retrieval of electronic healthcare data.

We have concluded **limited** assurance on this area. The significant matters requiring management attention include:

- There has been no LDR plan until recently. The current plan does not set out the full scope of the LDR programme including analysis and fully enabling the use of data, together with the resources required to deliver it.
- The LDR programme does not have a defined budget monitoring process, with costs associated with the LDR being held in multiple cost centres.
- There has been limited, visible reporting on the LDR programme and no ability for governance groups to monitor progress against an agreed plan. In addition due to the lack of formal governance, there is a lack of evidential clarity over the approval of the designs and approach taken within the Health Board and the comparison of the different approaches which would justify the decision.
- Due to the link to the NDR there was no scope document, PID or business case developed for the Health Board LDR, with the programme treated as business as usual. With an absence of a formal scope document and exercise there is a lack of clarity over the full needs of the Health Board, and a disconnect between the data architecture aspects and the analysis aspects.
- We note that currently the OpenStack environment is hosted on servers within the services accommodation centre (SAC). Although this is spread across the two rooms this provides no geographical resilience and reduces the benefits associated with hosting a private cloud.
- There is no documented evidence of approval of the LDRs open source approach, or of formal sign off of design, specifications, decisions or security review.
- There is no IG framework for the LDR and no DPIA that assesses the impact of the LDR. We also note a lack of a data governance process that sets out the requirements for data quality and maintenance, with no reference to data governance within the LDR plan.

Full details of matters arising are detailed within the Findings & Agreed Action Plan.

## Scope & Assurance Summary

**Objectives** The objectives and associated assurance ratings are not necessarily given equal weighting when formulating the overall audit opinion.

		Related Findings	Assurance
1	An appropriately resourced plan for the development of the LDR is in place, supported by robust governance arrangements.	1, 2, 3	<b>Limited</b>
2	A full needs assessment has been undertaken with appropriate stakeholders, both internal and external, to inform planning requirements and to set out a roadmap for delivery.	4	<b>Reasonable</b>
3	The LDR is of a resilient design and appropriate continuity and recovery measures are in place.	5, 6	<b>Reasonable</b>
4	Processes are in place to safeguard digital information throughout its lifecycle.	7	<b>Limited</b>
5	Appropriate arrangements are in place to ensure the LDR meets the foundational interoperability standard.	-	<b>Substantial</b>

### Management Actions



High Priority



Medium Priority

### Themes



- Governance
- Information, Data Quality & Data Accuracy
- Planning, Delivery & Deadline Management
- Finance Management & Control
- Cyber Security

### Risk Types

- Legal & Regulatory Non-Compliance
- Quality or Safety Issues
- Public Perception & Reputational Risk

# Findings & Agreed Action Plan

**Objective 1: An appropriately resourced plan for the development of the LDR is in place, supported by robust governance arrangements.**

**Limited**

## Overview / Summary of Observations

The LDR Programme came out of the NDR programme, with each organisation having to implement an LDR to feed and link to the NDR. Although the NDR programme has a formal programme structure, this was not replicated within the Health Board and the LDR development was treated more as business as usual, with leads for each aspect managing their part individually. As such there was no integrated plan that set out all the activities, timescales and resources needed to implement the LDR which included analytics and data democratisation. The lack of a plan has led to a lack of clarity over what is included and delays in accessing resource from within Digital, with requests of action such as setting up servers or changing firewall rules having to be made via help desk, or departmental communications as opposed to having actions pre-planned.

More recently a consultancy (C3) were tasked with defining what the LDR should be, and setting out the actions required. This has led to the development of a plan and the identification of interdependencies which is currently in use. This plan references work needed to expand use of the LDR such as data democratisation, however it does not set out all the actions to fully enable the use of, and analysis of data.

Due to the lack of an overarching plan for the programme the required resource and skills were not always identified in advance. We note that as required skills became evident then training was provided to staff, with training provided on skills such as OpenStack and Fast Healthcare Interoperability Resources (FHIR).

The LDR programme does not have a defined budget monitoring process, with costs associated with the LDR being held in multiple cost centres. We note that the LDR has received funding from the NDR programme, and these costs are clearly identified, although not as part of the programme overall.

There is a defined governance structure for the delivery of digital strategy items, with key groups noted as:

- Digital Health Intelligence Committee (DHIC)- for assurance purposes;
- Digital Services Management Board (DSMB)- for steering;
- Digital Advisory Board – for prioritisation and management;
- Technical Design Authority (TDA) – for technical concurrence;
- Clinical Design Authority – for clinical concurrence

However our review of the business of the key groups noted very little reporting on the LDR work to DHIC and the Digital Advisory Board, and the DSMB has not yet been established. We note that updates on the LDR design have been provided to the TDA, however the papers also note that the TDA cannot approve items, as such although there has been a review of the design there is no formal approval.

We note that there is reporting into the national NDR Programme via the NDR Programme Board and Delivery Group, for which there is Health Board representation and for which the Health Board provides updates on work undertaken.

As there was no formal project structure, there was no structured, formal reporting, with actions operationally tracked within the software development tool and a bi-weekly meeting within the Digital Directorate to report to the Digital Director and senior staff. This means that there has been limited, visible reporting on the LDR programme and no ability for governance groups to monitor progress against an agreed plan.

Due to the lack of formal governance, there is a lack of evidential clarity over the approval of the approach taken within the Health Board and the comparison of the different approaches which would justify the decision.

We note that project management resource has subsequently been provided and an improved project structure is starting to take place.

Key Findings	Risk & Impact	Agreed Management Action
<p>1</p> <p>There has been no LDR plan until recently. The current plan does not set out the full scope of the LDR programme including analysis and fully enabling the use of data, together with the resources required to deliver it.</p>	<p>The tasks and resource required to deliver the LDR are not fully established.</p>	<p>Retrospectively promote LDR through the Programme and Projects Gateway process. Employ formal evaluation processes to define the structure, governance, milestones, benefits and artefacts that are expected from the LDR team[s] in delivering a comprehensive solution.</p> <p>Expected Evidence of Implementation:</p> <p>Maintain a register of progress of LDR in delivering artefacts that align to milestones through the formal governance process and structures.</p>
<p>Theme: Planning, Delivery &amp; Deadline Management</p>	<p>Control Design</p>	<p>Officer: Assistant Director of Programmes D&amp;HI Date: 30<sup>th</sup> June 2025</p>
<p>2</p> <p>The LDR programme does not have a defined budget monitoring process, with costs associated with the LDR being held in multiple cost centres. We note that the LDR has received funding from the NDR programme, and these costs are clearly identified, although not as part of the programme overall. Without a defined cost centre and monitoring process the health board may not be able to effectively plan for the LDR and there is a lack of clarity over the costs associated with it.</p>	<p>The costs associated with the LDR cannot be easily identified.</p>	<p>The LDR has a defined budget for staffing costs only, with everything else coming out of the general D&amp;HI budget. Develop a Zero Baseline Budget position analysis against an agreed definition of the scope of LDR. Use the ZBB output to form the basis of a delivery and management budget for LDR.</p> <p>Expected Evidence of Implementation:</p> <p>Employ longitudinal benefits analysis to monitor progress of LDR delivery against the agreed budget.</p>
<p>Theme: Financial Management &amp; Control</p>	<p>Control Operation</p>	<p>Officer: Programme Manager D&amp;HI Date: 31<sup>st</sup> July 2025</p>
<p>3</p> <p>As there was no formal programme structure, there has been limited, visible reporting on the LDR programme and no ability for governance groups to monitor progress against an agreed plan. In addition due to the lack of formal governance, there is a lack of evidential clarity over the approval of the designs and</p>	<p>There is a lack of clarity over formal approvals.</p>	<p>All findings from this audit should be introduced to the Programme Gateway process (outlined against action #1) as Non-Functional Requirements (NFRs) that must be addressed within the processes and artefacts that are developed by LDR once it is confirmed as a Programme.</p>

<p>approach taken within the Health Board and the comparison of the different approaches which would justify the decision.</p>		<p>Expected Evidence of Implementation:</p> <p>Monitoring of programme delivery against governance gateways will be managed through a formal Programme Board. The Programme Board will, in turn provide update to the CAVUHB assurance board, being the Technical Design Authority (TDA).</p>
<p>Theme: Planning, Delivery &amp; Deadline Management</p>	<p><b>Medium Priority</b></p> <p>Control Design</p>	<p>Officer: Chief Clinical Information Officer &amp; Chair of TDA Date: 30<sup>th</sup> September 2025</p>

**Objective 2: A full needs assessment has been undertaken with appropriate stakeholders, both internal and external, to inform planning requirements and to set out a roadmap for delivery.**

**Reasonable**

Overview / Summary of Observations

The LDR programme encompasses a number of aspects under two main themes. The first being the data component which aims to collate and provide data, both to the NDR for sharing across Wales, and to the LDR for use within Cardiff and Vale. The second is the analysis and use component which aims to democratise data and enable better information. The requirements for the data component are, in general understood due to the link to the NDR, however the use of data aspects are not fully quantified.

Due to the link to the NDR there was no scope document, PID or business case developed for the Health Board LDR, with the programme treated as business as usual. With an absence of a formal scope document and exercise there is a lack of clarity over the full needs of the Health Board, and a disconnect between the data architecture aspects and the analysis aspects.

Key Findings	Risk & Impact	Agreed Management Action
<p>4 Due to the link to the NDR there was no scope document, PID or business case developed for the Health Board LDR, with the programme treated as business as usual. With an absence of a formal scope document and exercise there is a lack of clarity over the full needs of the Health Board, and a disconnect between the data architecture aspects and the analysis aspects.</p>	<p>The LDR may not fully deliver the Health Board needs.</p>	<p>The Programme management will act as a bridge between the National Programme and the work carried out within it and our local Programme. Artefacts from the NDR FBC may form a baseline for the scope to be defined in Management Action #1.</p> <p>The Health Board requirements will need to be captured and reviewed alongside the national requirements.</p> <p>Expected Evidence of Implementation:</p> <p>CAVUHB provides update to the national board on local work. The Programme Board will formalise this relationship. Additionally, the Programme Board will communicate national directives back to the CAVUHB LDR team[s].</p>
<p>Theme: Planning, Delivery &amp; Deadline Management</p>	<p><b>Medium Priority</b></p> <p>Control Design</p>	<p>Officer: Programme Manager D&amp;HI Date: 30<sup>th</sup> June 2025</p>

Overview / Summary of Observations

The architecture for the LDR is set out within a diagram produced by C3 with the approach taken being to use open source software. The underlying architecture uses OpenStack (an open standard cloud computing platform), with open source products for messaging (Kafka) and API management (WSO2).

We note that currently the OpenStack environment is hosted on servers within the services accommodation centre (SAC). Although this is spread across the two rooms this provides no geographical resilience and reduces the benefits associated with hosting a private cloud.

We were informed that the open source approach was agreed with the previous Digital Director, following an assessment of different options, however this was not documented and we note that there was no discussion at any digital group that would validate this.

The specifications, and assessments of products have been reviewed by the TDA, however this group does not have approval authority. We were informed the security have reviewed the specifications, however there is no formal documented security sign off and no formal approval of specifications or decisions by digital steering or management groups.

Key Findings	Risk & Impact	Agreed Management Action
<p>5</p> <p>We note that currently the OpenStack environment is hosted on servers within the services accommodation centre (SAC). Although this is spread across the two rooms this provides no geographical resilience and reduces the benefits associated with hosting a private cloud.</p>	<p>There is an increase risk of loss of service.</p>	<p>Establish a specific infrastructure project to underpin the LDR service. Ensure the infrastructure solution adheres to existing national and corporate standards, provides a mature management capability (which aligns to the All Wales Target Operating Model (TOM)) and minimises risk of technical debt by aligning to the Digital Foundations Programme.</p> <p>Expected Evidence of Implementation:</p> <p>The delivery of an infrastructure solution design that is approved through a formal governance process.</p>
<p>Theme: <a href="#">Cyber Security</a></p>	<p><b>Medium Priority</b> Control Design</p>	<p>Officer: Enterprise Architect D&amp;HI Date: 31<sup>st</sup> July 2025</p>
<p>6</p> <p>There is no documented evidence of approval of the LDRs open source approach, or of formal sign off of design, specifications, decisions or security review.</p>	<p>Risk of inappropriate design or security weakness</p>	<p>Define a comprehensive list of governance artefacts that will be included within a formal programme delivery capability.</p> <p>Expected Evidence of Implementation:</p> <p>Delivery of artefacts through the formal governance process to align with agreed project plans and delivery milestones.</p>
<p>Theme: <a href="#">Governance</a></p>	<p><b>Medium Priority</b> Control Design</p>	<p>Officer: Enterprise Architect D&amp;HI Date: 31<sup>st</sup> July 2025</p>

**Objective 4: Processes are in place to safeguard digital information throughout its lifecycle.**

**Limited**

Overview / Summary of Observations

Due to the previous absence of a programme structure and of an overall plan for the delivery of the LDR, there has been no continual liaison with Information Governance and cyber security. As such, although we were informed that security have reviewed the proposals, there is no record of this or of formal sign off. In addition, although there are data protection impact assessments (DPIAs) in place for some aspects of the LDR, there is no overarching information governance (IG) framework or DPIA that assesses the IG implications for the LDR. We do note that an IG framework for the NDR exists, however this would not fully meet the needs of the Health Board.

We note a stated intent from the senior product specialist to develop processes for managing the lifecycle of data, and note the creation of a proof of concept data catalogue which will enable the definition of data quality and governance rules, however there is nothing documented to define the actions for managing the lifecycle of data and ensuring that users can gain assurance over the quality and provenance of data being used.

Key Findings	Risk & Impact	Agreed Management Action
<p>7</p> <p>There is no IG framework for the LDR and no DPIA that assesses the impact of the LDR.</p> <p>We also note a lack of a data governance process that sets out the requirements for data quality and maintenance, with no reference to data governance within the LDR plan.</p> <p>Theme: Data Accuracy / Quality</p>	<p>Risk of breach of IG requirements and of poor quality data</p> <p><b>High Priority</b></p> <p>Control Operation</p>	<p>Ensure the artefacts defined at a programme-level provide a suitable baseline from which DPIA and cyber security compliance can be documented.</p> <p>Without appropriate Programme artefacts, that have been approved through the formal governance processes, both IG and Cyber will have dependencies on details that will not be available.</p> <p>Expected Evidence of Implementation:</p> <p>The successful completion of both DPIA and Cyber Security Assessment documentation and approval through a formal governance oversight.</p> <p>Officer: Head of Information Governance &amp; Cyber Security D&amp;HI Date: 30<sup>th</sup> September2025</p>

Welsh Government have mandated HL7 / FHIR as core requirements to ensure interoperability across Wales, and as part of the national NDR programme an interoperability standards working group has been established, and we note that there is C&V membership and attendance at this group which further embeds the need for interoperability.

The TDA has set out the standards to which the Health Board aspires, which include interoperability standards, specifically HL7 and FHIR. The group noted that exceptions will be considered on a case by case basis, as such there is the framework to ensure interoperability is considered at early stages of design.

We note that the Health Board has implemented 2 FHIR servers and the requirements for interoperability standards are being factored into procurement documentation.

# Appendix A

## Assurance Opinion

	<b>Substantial</b>	Few matters require attention and are compliance or advisory in nature. <b>Low impact</b> on residual risk exposure.
	<b>Reasonable</b>	Some matters require management attention in control design or compliance. <b>Low to moderate impact</b> on residual risk exposure until resolved.
	<b>Limited</b>	More significant matters require management attention. <b>Moderate impact</b> on residual risk exposure until resolved.
	<b>Unsatisfactory</b>	Action is required to address the whole control framework in this area. <b>High impact</b> on residual risk exposure until resolved.
	<b>Advisory</b>	Given to reviews and support provided to management which form part of the internal audit plan, to which the assurance definitions are not appropriate. These reviews are still relevant to the evidence base upon which the overall opinion is formed.

## Prioritisation of Findings

Priority	Explanation
<b>High</b>	Significant risk to achievement of a system objective OR evidence present of material loss, error, or misstatement. Poor system design OR widespread non-compliance.
<b>Medium</b>	Some risk to achievement of a system objective. Minor weakness in system design OR limited non-compliance.

Website: [Audit & Assurance Services - NHS Wales Shared Services Partnership](#)

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Audit work undertaken by NHS Wales Audit and Assurance Services conforms with the International Standards for the Professional Practice of Internal Auditing and associated Public Sector Internal Audit Standards as validated through the external quality assessment undertaken by the Chartered Institute of Public Finance & Accountancy in April 2023.

