

Data Quality

Final Internal Audit Report (Advisory)

May 2025

Cardiff & Vale University Health Board

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Auditors:	Ian Virgill - Head of Internal Audit Lucy Jugessur - Deputy Head of Internal Audit Martyn Lewis – Senior IM&T Audit Manager Sian Harries – IM&T Audit Manager
Executive sign-off:	David Thomas - Director of Digital & Health Intelligence
Distribution:	Mark Wardle - Chief Clinical Information Officer
Committee:	Audit & Assurance Committee



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Acknowledgement

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Executive Summary

Purpose

To review the arrangements and processes in place for ensuring data quality issues are detected, resolved and prevented within the Health Board.

Overview

As this is an advisory review no assurance rating is provided. We identified a number of internal control deficiencies relating to the following:

- Outdated Data Quality Policy and corresponding procedures;
- The Health Board’s server inventory lacks detailed links to hosted applications, services, and data flows;
- No structured approach or central oversight regarding Health Board representatives;
- Lack of data quality framework and governance structure;
- Absence of data quality training and guidance;
- Limited digital training;
- Absence of a data quality team or clearly defined individual responsibilities for overseeing and managing data quality;
- Lack of collaboration with departments to fix data quality issues; and
- Limited investigation of data quality issues unless they are significant in scale or impact.

In contrast to an assurance audit, we have not made formal recommendations but have identified opportunities that the Health Board may wish to take forward in order to address the deficiencies and further strengthen processes.

Opportunities:

		Audit Objective
1	Policies and Procedures	1
2	Data Flow Mapping	1
3	Health Board Representatives	2

Report Classification

Assurance not applicable



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.

Advisory Audit Objectives

Our review sought to ascertain and evaluate if:

1	The Health Board has a mechanism to enable a clear view of all its data assets; how they are aggregated and how the data flows.
2	The Health Board is aware of and manages its data relationships and boundaries with other organisations to ensure that data can flow throughout the organisation.
3	A good data quality culture is in place throughout the Health Board.
4	Adequate processes are in place to identify, review, correct and prevent data quality issues.

4	Data Quality Governance Structure	3
5	Data Quality Training	3
6	Digital Skills Assessment	3
7	Data Quality Accountability	4
8	Data Quality Feedback Mechanism	4
9	Investigation of Data Quality Issues	4

1. Introduction

- 1.1 Our advisory audit of Data Quality was undertaken and completed in line with the 2024/25 Internal Audit Plan for Cardiff and Vale University Health Board (the 'Health Board').
- 1.2 High quality data is important to any organisation. Within the NHS it can lead to improvements in patient care and patient safety. Quality data plays a role in improving services and decision making, as well as being able to identify trends and patterns, draw comparisons, predict future events and outcomes, and evaluate services.
- 1.3 Data quality measures how well suited a dataset is to serve its specific purpose, with measures of data quality being based on characteristics such as accuracy, completeness, consistency, validity, timeliness and precision.
- 1.4 The Health Board is working to develop its Data Quality Strategy, and this audit seeks to support its development by reviewing data quality management arrangements and supporting processes across the organisation to ensure factors that can impact or reduce data quality can be considered.
- 1.5 The Director of Digital & Health Intelligence is the lead for this review.

Advisory Audit Risks

- 1.6 The potential risks considered in this review are as follows:
 - Poor decision making.
 - Failure to achieve performance measures and organisational objectives.
 - Patient harm; and exposure to financial loss and reputational damage.

2. Detailed Audit Findings

Objective 1: The Health Board has a mechanism to enable a clear view of all its data assets and how they are aggregated and how the data flows, to improve operational efficiency, meet compliance obligations, mitigate risk and achieve data-driven business outcomes.

- 2.1 The Health Board is one of the largest and most complex NHS organisations in Wales, employing approximately 17,000 staff members. Given its size and the significant number of systems and datasets it manages, the Health Board cannot rely solely on the Information Governance (IG) team to identify and manage all information assets. Therefore, a comprehensive framework across the organisation to ensure their effective management and oversight is imperative. The role of the Information Asset Owners (IAO) is pivotal in this context, as they are responsible for maintaining the integrity and security of data within their respective domains. They must ensure that all information assets are accurately identified, meticulously managed, and appropriately utilised.

- 2.2 We note that IAOs have been established within each directorate. All clinical boards and directorates are aware of their responsibilities concerning data management, which includes the responsibility to oversee and control their information assets effectively.
- 2.3 Whilst a process is in place for IAOs to update their Information Asset Registers (IARs), we noted that the accompanying Information Asset Procedure has not been reviewed since 2015. **(Opportunity 1)**
- 2.4 There is some concern regarding the completeness and live maintenance of IARs across all areas. The Information Governance (IG) team currently does not have full assurance that IARs are being maintained as live documents in all areas. The response rate to IAR updates is low, with only around 30 of the required 93 IARs being submitted. This low response rate is attributed to two main factors: the lack of a live IAR in some areas and the significant pressure placed on clinical services to prioritise immediate patient care functions, which limits their capacity to focus on IAR updates.
- 2.5 To address the challenge of IAR compliance, and in recognition of the demands placed on clinical services, an in-house digital solution is being developed. Although the project is still in the scoping stage, it is likely to take the form of a Microsoft 365 Power App. This solution aims to streamline the collection, review, and oversight of data assets through the IARs. It will facilitate the completion of Business Impact Assessments (BIAs), with a focus on critical systems. The system will also centralise data from individual IARs, providing a unified source of information to enable the Health Board to better manage risk and support business continuity. The project is expected to be completed within the 2025/26 financial year.
- 2.6 The IAR template, designed by the IG team, is based on guidance from the Information Commissioner's Office (ICO). For those IARs that are completed, the IG team is confident that they contain all the required information as outlined in the template. The process and structure are aligned with best practices, ensuring that the IARs, when maintained, are comprehensive and compliant.
- 2.7 Whilst there is an inventory of health board-hosted servers, there is limited information regarding the mapping of these servers to specific applications and services. The inventory provides basic details about the servers themselves, but it lacks comprehensive information linking the servers to the applications or services they host. We also note that there is no visibility or documentation currently available to show the movement or flow of data between the systems hosted on Health Board servers. **(Opportunity 2)**
- 2.8 It is clear that a framework exists that can be built upon, as both IARs and an inventory are in place. From these, the IAOs can compile a comprehensive list of datasets and data flows, ultimately building an organisational data catalogue. This systematic approach will enhance data governance and compliance,
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facilitating better data utilisation and decision-making across the Health Board.
(Opportunity 2)

Conclusion:

- 2.9 IAOs are established across directorates, with clinical boards aware of their data management responsibilities. However, the Information Asset Procedure hasn't been reviewed since 2018, and IAR updates are incomplete, with only 30 of 93 submitted. This is due to a lack of live IARs in some areas and clinical service pressures. To address this, an in-house digital solution is being developed to streamline IAR updates, facilitate BIAs, and centralise data for improved risk management.
- 2.10 Additionally, the Health Board's server inventory lacks detailed mappings to applications and services, and there's no visibility of data flow between systems, highlighting another opportunity for improvement. Utilising the IARs and server inventory to create a comprehensive data catalogue could help improve data governance. IAOs, with their established roles across directorates, are well-placed to lead this effort by mapping datasets to applications, services, and data flows, thereby enhancing visibility, compliance, and overall data quality.

Objective 2: The Health Board is aware of and manages its data relationships and boundaries with other organisations to ensure that data can flow throughout the organisation.

- 2.11 The Health Board selects representatives for external meetings primarily based on their subject matter expertise and seniority within their respective fields. These individuals are typically part of senior teams and contribute both specialised knowledge and broader insights in discussions with external organisations.
- 2.12 However, a key issue identified is the lack of formal training or guidance for these representatives. Without proper guidance, boundaries between the Health Board and other organisations may be unclear, which can lead to misunderstandings, confusion, or conflicting expectations between the Health Board and other organisations or stakeholders. This could strain collaboration, hinder effective partnerships, and make it more difficult to align on shared goals or agreements, ultimately disrupting productive working relationships.
- 2.13 Although their expertise and seniority are crucial for these roles, there is no structured approach or central oversight regarding their representation of the Health Board in external engagements. Additionally, there is a lack of coordination and strategic alignment in the way representatives communicate and engage with other organisations. This can result in inconsistent messaging, misalignment with organisational goals, and poor decision-making, undermining credibility and reducing influence. Misrepresentation of the Health

Board's position can damage its reputation and erode trust among stakeholders. Additionally, representatives may make unauthorised commitments, leading to legal or ethical risks. Compounding these issues is a lack of visibility, as leadership often remains unaware of what other directorates are communicating or contributing to these engagements, exacerbating misalignment and inconsistency. **(Opportunity 3)**

Conclusion:

- 2.1 Whilst the Health Board benefits from selecting knowledgeable and senior representatives for external meetings, there is a clear opportunity to improve the consistency, alignment, and effectiveness of these engagements. By implementing formal training, centralised oversight, standardised communication protocols, and clear feedback mechanisms, the Health Board can enhance its external representation, strengthen its relationships with other organisations, and better align its efforts with its strategic objectives. These improvements would reduce risks related to inconsistent messaging, misalignment, and missed opportunities, ultimately contributing to more effective collaboration and decision-making.

Objective 3: A good data quality culture is in place throughout the Health Board ensuring high-quality data and fostering values to emphasise the importance of maintaining data quality. Arrangements are in place to ensure that staff have the appropriate knowledge, competencies, and capacity in their roles in relation to data quality and that this is embedded in all training and learning material.

- 2.2 Successful digital transformation relies heavily on good quality data, which is fundamental to informed decision-making and operational efficiency. Data quality is not solely the responsibility of Digital teams; rather, it should be regarded as an organisation-wide priority, with all directorates contributing to its maintenance and improvement.
- 2.3 Our review highlighted that there is currently no formal data quality structure in place. Whilst the Health Board has a digital strategy, its focus on data quality is limited, and there is currently no dedicated framework to support and enforce a culture of data quality across the organisation.
- 2.4 The Data Quality Policy and Data Quality Management Procedure have not been reviewed or updated since 2015. The Data Quality Policy, aimed at all staff, outlines eight key objectives for achieving data quality. The policy stipulates that all employees must comply with the established guidelines, with serious breaches, such as the unauthorised disclosure of personally identifiable information or misuse of IT resources, potentially leading to disciplinary action, including termination of employment and police involvement. Whilst this is a positive step, the absence of a formal data quality governance structure may hinder the effectiveness and efficiency of enforcing these measures.

- 2.5 The Data Quality Management Procedure is more detailed and explains the expectations for staff regarding the achievement of the data quality objectives and characteristics. Its purpose is to provide assurance to the Senior Information Risk Owner (SIRO) and the Board that appropriate frameworks are in place to support the Health Board's policies related to clinical care, business operations, legal requirements, and patient experience. Whilst we note that both remain outdated and currently lack plans for revision, we acknowledge that a data quality strategy needs to be developed first to align with broader organisational objectives. **(Opportunity 1)**
- 2.6 The Data Quality Sub-Group, which previously provided oversight and direction for data quality initiatives and was reportable to the Information Governance Sub Committee (IGSC), is no longer operational. This has led to a lack of coordinated efforts across the Health Board to manage and improve data quality, with no clear structure or accountability in place to support data quality objectives. We note from conversations with key contacts that data quality governance groups have been unsuccessful over the years. This could be attributed to the absence of a formal data quality strategy, as without one there are no clear objectives, priorities or a roadmap for the governance group to follow resulting in a lack of focus, working on fragmented initiatives with no clear sense of direction. **(Opportunity 4)**
- 2.7 During our review, we noted the absence of a dedicated, formal data quality training program for staff. This presents a potential risk to the Health Board's ability to ensure high-quality, accurate, and consistent data entry and management across departments. Without targeted training, staff may not fully understand the importance of data quality or may lack the necessary skills to manage and maintain data effectively. This could lead to errors in data entry, inconsistencies in records, and difficulty in leveraging data for decision-making, potentially impacting patient care, operational efficiency, and regulatory compliance. **(Opportunity 5)**
- 2.8 Although the Health Board has a dedicated Microsoft 365 hub on the intranet, which provides self-guided learning resources, it is important to recognise that this may not be suitable for all staff members. The approach of self-guided learning may not cater to different learning styles, such as those who may benefit more from interactive, instructor-led training or hands-on, scenario-based learning. As a result, some staff members may not fully engage with or retain critical information related to digital skills, reducing the overall effectiveness of the training resources provided. This concern is further reflected in the results of our staff survey, details of which can be found below, which indicate that some employees feel that current training methods do not fully meet their needs, particularly in relation to using digital tools and technologies effectively. **(Opportunity 6)**
- 2.9 As part of our fieldwork, we conducted a staff survey within the Health Board to assess the current state of digital skills, data quality awareness, and training
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effectiveness. The survey had a response rate of 30 staff members, and although the sample size is small, the feedback provides valuable insights into areas for improvement in digital practices and data quality management.

Digital Skills & Training:

- 68.9% of respondents agreed that they possess the appropriate skillset to undertake their role effectively and efficiently. However, 37.9% disagreed that they received adequate training and support to use the digital systems and tools required for their roles, while 34% felt neutral on this matter.
- When asked about training and support in digital practices, 90% expressed a positive view toward receiving such training.

Data Quality Training Needs:

- 52% of respondents felt they had not received adequate training on data quality and governance, with 17% unsure.

Data Quality Awareness & Engagement:

- 83% believe that data quality is essential to achieving the Health Board's goals, yet 41% stated they only occasionally hear about data quality as a priority, and 34% rarely or never hear about it.
- Only 24% were aware of the Health Board's data quality policy and guidelines.

Suggestions for Improvement by Respondents:

- Many respondents emphasised the need for better training resources, particularly face-to-face sessions instead of worksheets. They highlighted the importance of practical, real-world examples in training to ensure staff can apply data standards and governance effectively.
- The use of Microsoft 365 was identified as an opportunity to improve data capture and analysis. Respondents noted that many employees were either unaware of the tools available within the platform or lacked access to them.
- Reporting and accountability were also mentioned, with concerns that persistent errors in data entry were not being addressed due to a lack of clear feedback mechanisms.

Conclusion:

2.10 The Health Board lacks a formalised data quality structure, with outdated policies and procedures that are not being actively maintained. This absence of central oversight, coupled with the current lack of a comprehensive, up-to-date data quality strategy, undermines the ability to foster a strong data quality culture.

- 2.11 The findings from both the survey and our review suggest that there is a critical need for targeted data quality training and guidance. A formal, targeted data quality training program needs to be developed to ensure that staff fully understand their role in data quality and how their actions directly affect the accuracy, consistency, and reliability of data. Without this focused training, there is a risk that staff may not recognise the importance of data quality and / or may fail to apply the required practices consistently.
- 2.12 The survey results also suggest the need for a broader understanding of staff digital skills. Given the varying levels of digital competence across the Health Board, it is essential to assess the baseline skills across the workforce to identify areas that require further development. This assessment will help the Health Board tailor digital training and support to ensure that all staff are equipped to effectively utilise digital tools and contribute to improving overall data management and quality within the organisation.

Objective 4: Adequate processes are in place to identify, review, correct and prevent data quality issues.

- 2.14 As data quality should be a shared responsibility across all departments, it is crucial to establish clear roles and structures to ensure its ongoing management. Relying solely on Digital teams for data quality is insufficient due to the significant number of diverse datasets within the Health Board, which span across multiple departments, systems, and operational areas. Digital teams typically focus on the technical infrastructure and systems, but ensuring the accuracy, consistency, and reliability of data requires active engagement from every department that generates, manages, or uses data. This broad responsibility cannot rest on a single team alone and must be a collective effort across the entire organisation.
- 2.15 Our review highlighted that the Health Board currently lacks a dedicated data quality team or clearly defined individual responsibilities for overseeing and managing data quality. While it is important to have an accountable structure, the absence of a designated team does not mean that a single group should bear the full responsibility. Rather, the focus should be on providing oversight and support to enable all departments to contribute to data quality management. However, there is currently no operating structure in place to achieve this effectively. As noted earlier in our report under objective 1, utilising the IAR and inventory to create a data catalogue could serve as a suitable framework for driving data quality. With IAOs already established across directorates, they are ideally placed to lead this initiative, providing the necessary oversight and ensuring that data quality is consistently maintained and improved across all areas of the Health Board. **(Opportunity 7)**.
- 2.16 Whilst a Business Intelligence (BI) team is in place, their focus is primarily on the technical aspects of data monitoring once the data has been fed into the warehouse. Without a formal, cross-functional structure that spans the entire

Health Board, data quality management remains disjointed and is not consistently monitored or addressed across all departments or systems before data enters the warehouse. This gap results in inconsistent data management practices and a lack of proactive oversight, allowing potential issues to go unnoticed until they affect operational performance or external reporting.

- 2.17 Currently, there is no established feedback mechanism, such as dashboards or reports, to alert departments of potential data quality issues that fall under their responsibility. As a result, departments are not made aware of data issues in real-time, nor are they engaged in the process of investigating and correcting these issues. By not being involved in addressing data quality concerns, staff may lack an understanding of the broader impact their actions (or lack thereof) have on overall data quality. It is important to note that data quality issues arising from incorrect data entry, particularly in clinical systems, should not be the sole responsibility of digital teams to resolve. Digital teams typically do not have the necessary expertise to investigate and fix erroneous clinical data. Without proper departmental involvement, there is a risk that these issues will remain unresolved, potentially impacting the accuracy and reliability of critical data used for decision-making and reporting. **(Opportunity 8)**
- 2.18 The Business Intelligence System (BIS) used by the BI team includes internal dashboards designed to monitor data quality issues once data has been loaded into the data warehouse. However, these dashboards are only accessible to the BI team and are relevant primarily to internal processes. **(Opportunity 8)**
- 2.19 A reconciliation process is in place to ensure that the data received from source systems matches the data stored in the data warehouse. While this process is important for identifying discrepancies between systems, it is not sufficiently comprehensive to address all data quality concerns.
- 2.20 Whilst we acknowledge that some data quality algorithms have been created to identify and resolve data issues within Health Board systems such as the Patient Management System, we note that they have not been developed and implemented in a formalised manner. This lack of formal implementation stems from the absence of a structured data quality framework within the Health Board. As a result, while there are efforts to address data issues, they have not been consistently or comprehensively managed, potentially leading to gaps in data integrity and reliability. **(Opportunity 4)**
- 2.21 Data quality issues are often only investigated when they are significant in scale or impact, such as those affecting data reported externally or in large volumes. We note that this is primarily due to resource constraints within the BI team. Smaller issues may be deprioritised or not fully investigated, which results in unresolved data quality problems persisting within the affected system. This inconsistent approach means that some data errors might continue unchecked until they escalate into larger issues, undermining the reliability and trustworthiness of data used across the Health Board. **(Opportunity 9)**
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2.22 Data quality management is predominantly reactive, with issues being identified through operational groups or the service desk only after they have impacted data outputs. As a result, data quality fixes are typically implemented on a reactive basis. For example, we noted that the data warehouse team became aware of an issue with the inpatient activity feed, and following investigation it was discovered that the failure was caused by excessive characters in the patient postcode field. This was only identified after the feed failed multiple times and error messages were triggered. Although the problem was eventually corrected, this approach highlights that data quality issues are often addressed only after they have caused operational disruptions. A more proactive approach, where issues are anticipated and addressed before they escalate, would help improve overall data quality. **(Opportunity 8)**

Conclusion:

2.23 The Health Board currently lacks a comprehensive, structured approach to data quality management, which is leading to fragmented oversight and reactive issue resolution. The absence of a dedicated data quality team and clearly defined responsibilities, coupled with insufficient cross-functional collaboration, has resulted in inconsistent monitoring and management of data quality across departments. Existing tools, such as BI dashboards, are limited in accessibility, reducing departmental awareness and involvement in addressing data quality issues. Furthermore, data quality management is primarily reactive, with smaller issues often being deprioritised until they escalate into larger problems. To address these gaps, it is essential for the Health Board to implement a formal data quality governance framework, including clear roles, accessible monitoring tools, and proactive processes to ensure data integrity across all systems. This would help enhance the reliability, accuracy, and trustworthiness of critical data used for decision-making and reporting.

Appendix A: Opportunities for improvement and development

Finding 1: Policies and Procedures		Residual Risk
<p>We note the following key policies and procedures are outdated and were due for review in 2018:</p> <ul style="list-style-type: none"> Data Quality Policy Data Quality Management Procedure Information Asset Register Procedure <p>This could result in inconsistent data management practices across departments, leading to fragmented data quality efforts and confusion among staff.</p>		<ul style="list-style-type: none"> poor decision making; failure to achieve performance measures and organisational objectives; patient harm; and exposure to financial loss and reputational damage.
Opportunity 1		Priority
<p>1.1 Once the data quality strategy has been developed and key initiatives have been defined, it is critical to align the Health Board's policies and procedures to ensure they support the newly established framework. This will help institutionalise the strategy, create consistency in practices, and ensure clear guidance for staff on how to manage and uphold data quality across all systems.</p>		<p>N/A - Advisory Review</p>
<p>1.2 Once the data quality policy and related procedures have been updated, the Health Board should ensure that all staff are fully informed about the policy, its content, and its significance. This can be achieved through targeted communication campaigns, such as emails, intranet postings, department meetings, and mandatory training sessions. It is essential to emphasise the importance of adhering to these guidelines in maintaining high-quality data and supporting the organisation's goals.</p>		
Management Response 1	Target Date	Responsible Officer
<p>1.1 We fully agree with this suggestion. The Health Board recognises that aligning policies and procedures with our forthcoming Data Quality Strategy is essential to institutionalising consistent data practices across the organisation. Following the development of our comprehensive Data Quality Strategy (planned for completion</p>	Q4 25/26	David Thomas, Director of Digital & Health Intelligence

<p>by Q4 2025/26), we will promptly update and harmonise key policies, procedures, and guidance documentation. This will provide clear, unified instructions to all staff, significantly strengthening data quality governance, supporting interoperability, and embedding best practices into daily operations. Data should meet the FAIR principles: findable, accessible, interoperable and re-usable. A key reflection is that there is no single action to improve data quality – instead it is a ‘system’ wide issue and actions must include improvements to processes and procedures, provide greater visibility into data flows and their quality, both real-time and in batch, and improvements to automating feedback and monitoring.</p>		
<p>1.2 We fully support this suggestion. Upon updating our Data Quality Policy and related procedures, the Health Board will implement targeted communication and training strategies to ensure all staff are thoroughly informed of their content, significance, and practical implications. This will include structured email updates, dedicated intranet resources, departmental briefings, and mandatory training sessions tailored to different staff groups. Our goal is to clearly articulate the importance of adhering to these guidelines, reinforcing their role in achieving consistent, high-quality data that underpins the organisation's strategic and operational objectives.</p>	<p>Q4 25/26</p>	<p>David Thomas, Director of Digital & Health Intelligence</p>

Finding 2: Data Flow Mapping	Residual Risk
<p>The Health Board’s current inventory of hosted servers provides basic information about the servers themselves, but it lacks crucial details linking these servers to the specific applications and services they host. Additionally, there is no clear visibility or documentation showing the movement or flow of data between these systems. This lack of comprehensive mapping and data flow visibility presents an opportunity to strengthen data governance, enhance system integration, and improve overall data management.</p> <p>It is clear that a framework exists that can be built upon, as both IARs and an inventory are in place. From these, the IAOs can compile a comprehensive list of datasets and data flows, ultimately building an organisational data catalogue. This systematic approach will enhance data governance and compliance, facilitating better data utilisation and decision-making across the health board.</p>	<ul style="list-style-type: none"> • poor decision making; • failure to achieve performance measures and organisational objectives; • patient harm; and exposure to financial loss and reputational damage.
Opportunity 2	Priority
<p>To undertake an initiative to enhance the inventory of hosted servers by:</p> <ol style="list-style-type: none"> 2.1 Updating the inventory to include detailed mappings of each server to the specific applications, services, and functions it supports. This will provide a comprehensive view of the technical environment, helping to identify critical systems and reduce the risk of data silos. It will also aid in better management and oversight of the systems and their interdependencies. 2.2 Implementing a process to create and maintain detailed data flow diagrams that track the movement of data across systems. These diagrams should illustrate how data is transferred, processed, and stored across various servers and applications, highlighting potential vulnerabilities or bottlenecks in data handling. This will improve transparency and facilitate better decision-making regarding data management, security, and system integrations. 	<p style="text-align: center;">N/A - Advisory Review</p>

<p>2.3 Establishing a routine process to regularly update the server-to-application mapping and data flow diagrams to reflect changes in the IT landscape. As the Health Board evolves, it is critical that these documents remain up-to-date to ensure accurate and effective oversight.</p>		
<p>2.4 Utilising the IAR and the Health Board-hosted server inventory to create a comprehensive organisational data catalogue, with IAOs leading this initiative. As IAOs have been established in each directorate, they are best placed to leverage the existing framework to map datasets to specific applications, services, and their associated data flows. The data catalogue will also enable better tracking of data usage, improve compliance with data management policies, and support informed decision-making across the organisation.</p>		
Management Response 2	Target Date	Responsible Officer
<p>2.1 We fully agree with this suggestion. To achieve this, the Health Board will expand our ongoing project to develop an advanced digital solution (Power App), originally intended to improve the accuracy and completeness of Information Asset Registers (IARs). Specifically, this initiative will include comprehensive mappings of all hosted servers to the applications, services, and functions they support. This enhanced visibility will facilitate clearer identification of critical systems, clarify interdependencies, reduce data silos, and strengthen overall data governance.</p>	Q2 25/26	James Webb, Head of Information Governance and Cyber Security
<p>2.2 Our LDR programme will support our vendor-neutral data architecture approach, providing a 'data fabric' representing standards based data flows, and making such data available in repositories using recognised international standards such as OMOP CDM and HL7 FHIR supporting standardisation, aggregation and vendor-neutrality, thus promoting data democratisation and reducing dependency on proprietary schemas.</p>	Q4 25/26	Dave Price, Head of Architecture and Analytics Leitchan Smith

<p>2.3 Responsibility for ensuring mapping, data flows and data catalogues are accurate and up to date will be the responsibility of a new "Data steering group" (DSG) - see below (opportunity 4) – and the existing "Technical Design Authority in relation to standards. The DSG will act to 'commission' changes to existing data flows and publication of 'data products'. We will leverage existing plans for a Change Advisory Board (CAB) that will include tracking and approving changes to the LDR programme and supporting infrastructure, reflecting improvements in the organisation's change management processes in reducing the untoward impact of change across applications, systems and data products.</p>	Q2 25/26	<p>David Thomas, Director of Digital & Health Intelligence Mark Wardle, Chief Clinical Information Officer – DSG and TDA Nigel Lewis, Assistant Director of IT Russell Kent, Head Of Digital Operations Dave Price, Head of Architecture and Analytics – LDR and CAB</p>
<p>2.4 The LDR team will be commissioned to evaluate and trial a data catalogue product for evaluation purposes, in combination with experience from Powys Health Board and a commercial vendor (Databricks). We would expect such a product to support centralised access control, auditing, lineage, and data discovery capabilities.</p>	Q2 25/26	<p>Mark Wardle, Chief Clinical Information Officer Dave Price, Head of Architecture and Analytics</p>

Finding 3: Health Board Representatives	Residual Risk
<p>Although their expertise and seniority are crucial for these roles, there is no structured approach or central oversight regarding Health Board representatives and their representation of the Health Board in external engagements. Additionally, there is a lack of coordination and strategic alignment in the way representatives communicate and engage with other organisations. This can result in inconsistent messaging, misalignment with organisational goals, and poor decision-making, undermining credibility and reducing influence. Misrepresentation of the Health Board’s position can damage its reputation and erode trust among stakeholders. Additionally, representatives may make unauthorised commitments, leading to legal or ethical risks. Compounding these issues is a lack of visibility, as leadership often remains unaware of what other directorates are communicating or contributing to these engagements, exacerbating misalignment and inconsistency.</p>	<ul style="list-style-type: none"> • poor decision making; • failure to achieve performance measures and organisational objectives; • patient harm; and exposure to financial loss and reputational damage.
Opportunity 3	Priority
<p>3.1 Implement a data governance framework that outlines how external engagements are tracked, ensuring that all interactions are properly documented and monitored. This could include creating a central repository for meeting notes, decisions, and action items that are shared across the Health Board.</p>	<p>N/A - Advisory Review</p>
<p>3.2 Develop formal training for all Health Board representatives to include data governance, compliance, and ethical decision-making to ensure they manage data responsibly and align with organisational goals in external engagements. Training on communication, data interpretation, and relationship management will help maintain consistency and build strong partnerships. Proficiency in digital tools and risk management will further enhance their effectiveness and reduce potential risks.</p>	
<p>3.3 Set up a dedicated internal Microsoft Teams channel for all Health Board representatives. This channel would serve as a centralised platform for sharing updates, key messages, data-sharing guidelines, and any relevant documents related to external engagements. Representatives could access and contribute to a shared knowledge base, ensuring consistent communication and alignment with the Health Board's goals.</p>	

Management Response 3	Target Date	Responsible Officer
<p>3.1 Our existing 'Data Insights Group' will evolve into a formal 'Data Steering Group' (DSG) with clinical and operational leadership representation. The DSG will drive aspirational data quality targets, enabling benchmarking across clinical boards (see opportunity 4 below). External engagements relating to data will be tracked via this DSG, engagements relating to technical and data standards will be tracked via our existing Technical Design Authority (TDA), and engagements relating to clinical matters tracked via our existing Clinical Design Authority (CDA). External engagements will include representatives to partner organisations such as regional HBs, PHW, WG and DHCW.</p>	Q4 25/26	<p>David Thomas, Director of Digital & Health Intelligence – DSG</p> <p>Mark Wardle, Chief Clinical Information Officer – TDA</p> <p>Aron White, Nurse Informatics Lead - CDA</p>
<p>3.2 We will continue our work with colleagues such as Medical Education, our O365 team, our internal training team, our HR/Workforce function to improve these capabilities amongst our workforce. We will perpetuate examples of good work such as the assessment of digital capability undertaken by our nurse colleagues leading on implementation of WNCR which had high reusability to inform what was needed for the EPMA programme and the learning models adopted for each.</p>	Q4 25/26	<p>David Thomas, Director of Digital & Health Intelligence</p> <p>With Mark Wardle, Chief Clinical Information Officer and Kerry Ashmore, Head of Business Intelligence</p>
<p>3.3 We agree and such an approach makes use of existing investments such as those within the Microsoft 365 platform such as Teams and SharePoint. We will supplement this with the use of existing communication channels such as the 'Health Informatics Forum' to raise the profile of digital and data, and the quality agenda underpinning both.</p>	Q2 25/26	Kerry Ashmore, Head of Business Intelligence

Finding 4: Data Quality Governance Structure	Residual Risk
<p>The Data Quality Sub-Group, which previously provided oversight and direction for data quality initiatives and was reportable to the Information Governance Sub Committee (IGSC), is no longer operational. This has led to a lack of coordinated efforts across the Health Board to manage and improve data quality, with no clear structure or accountability in place to support data quality objectives. We note from conversations with key contacts that data quality governance groups have been unsuccessful over the years. This could be attributed to the absence of a formal data quality strategy, as without one there are no clear objectives, priorities or a roadmap for the governance group to follow resulting in a lack of focus, working on fragmented initiatives with no clear sense of direction.</p>	<ul style="list-style-type: none"> • poor decision making; • failure to achieve performance measures and organisational objectives; • patient harm; and exposure to financial loss and reputational damage.
Opportunity 4	Priority
<p>4.1 Embed data quality governance within key operational and clinical areas of the Health Board. Appoint Data Quality Leads within departments who report directly to senior management to drive accountability and set up regular communication forums, such as quarterly data quality meetings or an internal Teams Channel dedicated to data quality, where updates, best practices, challenges, and successes can be shared.</p>	<p>N/A - Advisory Review</p>
<p>4.2 Create a centralised Data Quality Group or Committee to establish accountability for data quality within the Health Board, that has clearly defined roles, responsibilities, and decision-making authority. This committee should be supported by data quality leads across departments to foster engagement at all levels.</p>	
<p>4.3 Develop and implement key data quality metrics as part of the data quality governance structure. These metrics should be designed to track and evaluate the effectiveness of data quality management efforts, providing clear performance indicators across all departments and systems. By establishing these metrics, the Health Board can enable better performance management, identify areas for improvement, and ensure that data quality issues are addressed proactively. Regular monitoring and</p>	

reporting of these metrics will help drive accountability, support decision-making, and ensure that data quality remains a priority throughout the organisation.		
Management Response 4	Target Date	Responsible Officer
4.1 Our existing 'Data Insights Group' will evolve into a formal 'Data Steering Group' (DSG) with clinical and operational leadership representation. The DSG will drive aspirational data quality targets, enabling benchmarking across clinical boards. Clinical boards will appoint senior representatives responsible for digital and data, strengthening their participation in organisation-wide data governance.	Q3 24/25	David Thomas, Director of Digital & Health Intelligence
4.2 As per 4.1		
4.3 We will work to document our existing local and national data reporting requirements and develop automated quality metrics to identify issues relating to poor data quality. It is likely that a significant data quality gap relates to the clinical coding of diagnostic and procedural events, currently manual and error-prone due to reliance on paper-based processes. Electronic solutions, particularly those capturing procedural codes at the point of care (e.g., theatres), would streamline clinical coding and enhance accuracy through automation supervised by expert coders and such approaches should therefore be prioritised in planning digital investments.	Q4 24/25	Kerry Ashmore, Head of Business Intelligence - for data quality reporting. David Thomas, Director of Digital & Health Intelligence and Mark Wardle, Chief Clinical Information Officer - relating to FBC for electronic health record components/modules

Finding 5: Data Quality Training		Residual Risk
<p>During our review, we noted the absence of a dedicated, formal data quality training program for staff. This presents a potential risk to the Health Board's ability to ensure high-quality, accurate, and consistent data entry and management across departments. Without targeted training, staff may not fully understand the importance of data quality or may lack the necessary skills to manage and maintain data effectively. This could lead to errors in data entry, inconsistencies in records, and difficulty in leveraging data for decision-making, potentially impacting patient care, operational efficiency, and regulatory compliance.</p>	<ul style="list-style-type: none"> • poor decision making; • failure to achieve performance measures and organisational objectives; • patient harm; and exposure to financial loss and reputational damage. 	
Opportunity 5		Priority
<p>Develop a formal, structured data quality training program tailored to the specific needs of different departments and roles within the Health Board. This will ensure that all staff understand the critical importance of data quality and how their specific role impacts the accuracy and consistency of data. By providing targeted training, employees will be better equipped to follow best practices for data management and avoid errors that could affect patient care or operational efficiency.</p>		<p>N/A - Advisory Review</p>
Management Response 5	Target Date	Responsible Officer
<p>We will continue our work with colleagues such as Medical Education, our O365 team, our internal training team, our HR/Workforce function to improve these capabilities amongst our workforce. We will develop upon the existing examples of good work such as the assessment of digital capability undertaken by colleagues leading on implementation of WNCR which had high reusability to inform what was needed for the EPMA programme and the learning models adopted for each within different staff groups. (see opportunity 6)</p>	<p>Q4 25/26</p>	<p>David Thomas, Director of Digital & Health Intelligence</p>

Finding 6: Digital Skills Assessment		Residual Risk
<p>Although the health board has a dedicated Microsoft 365 hub on the intranet, which provides self-guided learning resources, it is important to recognise that this may not be suitable for all staff members. The approach of self-guided learning may not cater to different learning styles, such as those who may benefit more from interactive, instructor-led training or hands-on, scenario-based learning. As a result, some staff members may not fully engage with or retain critical information related to digital skills, reducing the overall effectiveness of the training resources provided. This concern is further reflected in the results of our staff survey, which indicate that some employees feel that current training methods do not fully meet their needs, particularly in relation to using digital tools and technologies effectively.</p>		<ul style="list-style-type: none"> • poor decision making; • failure to achieve performance measures and organisational objectives; • patient harm; and exposure to financial loss and reputational damage.
Opportunity 6		Priority
<p>Assess the baseline digital skills across the workforce to identify areas that require further development. This would allow the Health Board to evaluate the current level of digital proficiency among staff and identify areas where improvement is needed. By assessing staff's capabilities in using digital tools and technologies, the Health Board would be able to better understand the specific skill gaps that exist within the workforce. This insight would enable the development of targeted training initiatives that are tailored to meet the varying needs of staff, ultimately improving the effectiveness of digital systems and enhancing operational efficiency. Additionally, this assessment would help ensure that staff are fully equipped to embrace future digital advancements, improving overall adaptability to new technologies.</p>		N/A - Advisory Review
Management Response 6	Target Date	Responsible Officer
<p>A baseline digital skills assessment will be conducted. We will explore a range of training delivery methods including e-learning platforms, instructor-led interactive sessions, scenario-based workshops, and hands-on practical labs, to effectively cater to diverse learning styles and roles. In line with opportunity 5, we have already recognised that different staff groups require different approaches, and hands-on training may be appropriate for some for example. Similarly, we will look to investigate how value-based</p>	Q4 25/26	David Thomas, Director of Digital & Health Intelligence

appraisal might be used to provide alignment across different clinical boards and disciplines.

Finding 7: Data Quality Accountability		Residual Risk
<p>Our review highlighted that the Health Board currently lacks a dedicated data quality team or clearly defined individual responsibilities for overseeing and managing data quality. While it is important to have an accountable structure, the absence of a designated team does not mean that a single group should bear the full responsibility. Rather, the focus should be on providing oversight and support to enable all departments to contribute to data quality management. However, there is currently no operating structure in place to achieve this effectively. As noted earlier in our report under objective 1, utilising the IAR and inventory to create a data catalogue could serve as a suitable framework for driving data quality. With IAOs already established across directorates, they are ideally placed to lead this initiative, providing the necessary oversight and ensuring that data quality is consistently maintained and improved across all areas of the Health Board.</p>	<ul style="list-style-type: none"> • poor decision making; • failure to achieve performance measures and organisational objectives; • patient harm; and exposure to financial loss and reputational damage. 	
Opportunity 7		Priority
<p>Establish a clear structure for data quality management, with a dedicated team to provide oversight and support. While the primary responsibility for driving data quality should rest with the IAOs in each directorate, the data quality team should assist in ensuring consistent monitoring and improvement.</p>		<p>N/A - Advisory Review</p>
Management Response 7	Target Date	Responsible Officer
<p>The new 'Data steering group' (DSG) will take on this role, making use of existing teams such as Business Intelligence, and LDR, to report on data quality issues and trends, but work with clinical and operational colleagues in an 'all-system' fashion ensuring data quality is 'everyone's business' from the conception, design or procurement of digital and</p>	<p>Q4 25/26</p>	<p>David Thomas, Director of Digital & Health Intelligence</p>

data systems, to the ongoing monitoring and real-time feedback on data quality concerns, and in coordination with clinical and operational colleagues.

Finding 8: Data Quality Feedback Mechanism	Residual Risk
<p>There is no established feedback mechanism, such as dashboards or reports, to alert departments of potential data quality issues that fall under their responsibility. As a result, departments are not made aware of data issues in real-time, nor are they engaged in the process of investigating and correcting these issues. By not being involved in addressing data quality concerns, staff may lack an understanding of the broader impact their actions (or lack thereof) have on overall data quality. It is important to note that data quality issues arising from incorrect data entry, particularly in clinical systems, should not be the sole responsibility of digital teams to resolve. Digital teams typically do not have the necessary expertise to investigate and fix erroneous clinical data. Without proper departmental involvement, there is a risk that these issues will remain unresolved, potentially impacting the accuracy and reliability of critical data used for decision-making and reporting.</p> <p>Data quality management is primarily reactive, with issues being identified either through operational groups or the service desk after they have already impacted data outputs. The Business Intelligence System (BIS) used by the BI team includes internal dashboards designed to monitor data quality issues once data has been loaded into the data warehouse. However, these dashboards are only accessible to the BI team and are relevant primarily to internal processes.</p>	<ul style="list-style-type: none"> • poor decision making; • failure to achieve performance measures and organisational objectives; • patient harm; and exposure to financial loss and reputational damage.
Opportunity 8	Priority
<p>8.1 Establish a feedback mechanism, such as automated dashboards or reports, to notify relevant departments of data quality issues within their systems. This should be tailored to ensure that departments are made aware of issues that fall under their responsibility and are given the tools and insights necessary to investigate and resolve these problems. By fostering departmental ownership of data quality, the Health Board will empower staff to better understand and address the impact of their data entry practices, leading to improved overall data integrity and reliability.</p>	<p>N/A - Advisory Review</p>

8.2 While we understand that financial constraints may limit the ability to allocate additional resources to the BI team, it is recommended that the Health Board consider the potential need for additional resources to develop and expand the BI dashboards as proposed. Expanding their accessibility beyond the BI team would enhance data quality monitoring across departments and improve proactive identification and resolution of data issues. If resource constraints make immediate expansion challenging, the Health Board could explore phased implementation or prioritise the development of key dashboards that provide the most significant impact on data quality management. This approach would help balance financial limitations while addressing the need for improved data quality oversight.

Management Response 8	Target Date	Responsible Officer
<p>We agree. There are existing investments in data warehousing tools but a existing pilot work to replace 'Signals From Noise' (SfN) using Power BI have progressed well and permit the development of dashboards as well as potentially improving data democratisation through improving access to different data as well as permitting others outside of the core Business Intelligence team to develop dashboards of their own. We would aspire to build a community of practice around these tools to foster re-use and training across the organisation.</p>	<p>Q4 25/26</p>	<p>Kerry Ashmore, Head of Business Intelligence</p>

Finding 9: Investigation of Data Quality Issues		Residual Risk
<p>Data quality issues are often only investigated when they are significant in scale or impact, such as those affecting data reported externally or in large volumes. We note that this is primarily due to resource constraints within the BI team. Smaller issues may be deprioritised or not fully investigated, which results in unresolved data quality problems persisting within the affected system. This inconsistent approach means that some data errors might continue unchecked until they escalate into larger issues, undermining the reliability and trustworthiness of data used across the Health Board.</p>		<ul style="list-style-type: none"> • poor decision making; • failure to achieve performance measures and organisational objectives; • patient harm; and exposure to financial loss and reputational damage.
Opportunity 9		Priority
<p>Implement a consistent and systematic approach to investigating and addressing data quality issues, regardless of their scale or impact. Smaller issues should not be deprioritised; instead, a triage process should be established to assess the severity and potential downstream impact of all data issues. This will help ensure that data quality problems are addressed promptly before they escalate into larger, more disruptive issues. A prioritisation framework should be developed, considering both the volume and criticality of data issues, to ensure a balanced approach to data quality management.</p>		N/A - Advisory Review
Management Response 9	Target Date	Responsible Officer
<p>We expect the 'Data Steering Group' (DSG) to take a lead role in this. The existing 'Data insights group' has had broad membership across digital and operational services and is ready to mature into taking responsibility for providing strategic oversight and a commissioning role for data products, the quality of those data publications and supporting infrastructure.</p>	Q4 25/26	David Thomas, Director of Digital & Health Intelligence

Appendix B: Assurance opinion and action plan risk rating

Audit Assurance Ratings

We define the following levels of assurance that governance, risk management and internal control within the area under review are suitable designed and applied effectively:

	Substantial assurance	Few matters require attention and are compliance or advisory in nature. Low impact on residual risk exposure.
	Reasonable assurance	Some matters require management attention in control design or compliance. Low to moderate impact on residual risk exposure until resolved.
	Limited assurance	More significant matters require management attention. Moderate impact on residual risk exposure until resolved.
	Unsatisfactory assurance	Action is required to address the whole control framework in this area. High impact on residual risk exposure until resolved.
	Assurance not applicable	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 Recommendations

We categorise our recommendations according to their level of priority as follows:

Priority level	Explanation	Management action
High	Poor system design OR widespread non-compliance. Significant risk to achievement of a system objective OR evidence present of material loss, error or misstatement.	Immediate*
Medium	Minor weakness in system design OR limited non-compliance. Some risk to achievement of a system objective.	Within one month*
Low	Potential to enhance system design to improve efficiency or effectiveness of controls. Generally issues of good practice for management consideration.	Within three months*

* Unless a more appropriate timescale is identified/agreed at the assignment.



NHS Wales Shared Services Partnership
4-5 Charnwood Court
Heol Billingsley
Parc Nantgarw
Cardiff
CF15 7QZ

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