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SWYDDFA **ARCHWILIO** CYMRU

Data Quality

# Powys Teaching Health Board

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# Status of report

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The person who delivered the work was Jenny Trevor.

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# Summary report

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1. The NHS in Wales uses information as an integral part of its approach to delivering health services. Operationally, NHS bodies are now fully reliant on electronic information systems to support a range of key activities including:
  - patient administration, scheduling and booking;
  - diagnostic processes, ordering tests, requesting and viewing results;
  - joining primary and secondary care pathways, sharing potentially lifesaving critical patient information;
  - effective financial management and enabling management of productivity;
  - identification of patient and demographic needs, so that services can be tailored and focussed in areas that will achieve most benefit; and
  - identification and achievement of clinical and business outcomes.
2. The information used to support management and healthcare delivery is only reliable if the quality of the underpinning data is sound. The NHS Wales Informatics Service (NWIS) identifies six core elements that affect data quality, which are timeliness, completeness, validity, consistency, precision and accuracy. While it is rarely possible to ensure data is 100 per cent correct, 100 per cent of the time, it is critical that health bodies have appropriate and effective data quality arrangements in place to minimise clinical risk, support effective operational delivery and management, and to underpin performance management and assurance processes.
3. In 2008, the Corporate Health Information Programme (CHIP) undertook a review across the former NHS Trusts and Powys Local Health Board to assess the data quality arrangements. The report identified a range of varying practices, and made a number of recommendations to improve arrangements. The recommendations were formally issued to all NHS Trusts and Local Health Boards in a Ministerial Letter (EH/ML/007/08) which was issued in September 2008. The work of the CHIP now forms part of NWIS. While NWIS has not formally followed up the original report, it continues to co-ordinate and monitor the validity of key data.
4. As part of its work to review NHS bodies' arrangements for ensuring efficient, effective and economical use of resources, the Wales Audit Office has examined data quality arrangements in all Health Boards and NHS Trusts across Wales. Designed with input from NWIS, this review set out to identify whether Powys Teaching Health Board (the Health Board) has effective data quality arrangements.
5. Whilst this review is not a direct follow-up of the 2008 Ministerial recommendations, we have sought to incorporate each of these areas into our review work. The audit has therefore examined:
  - governance and accountability arrangements relating to data quality;
  - data quality operational arrangements, including local responsibilities, processes, procedures and policy, and approaches for internally monitoring and reporting the effectiveness of data quality processes; and
  - data quality performance.

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6. In undertaking this review, we have assessed key relevant documentation and reports, and have undertaken a series of interviews with a range of staff across the Health Board. We have also undertaken a data analysis exercise to identify the extent of duplicate patient records in the main Patient Administration System (PAS) as an indicator of the effectiveness of data quality arrangements. This review has focussed on data quality arrangements for the Health Board's own data, and therefore does not consider data quality arrangements for primary care datasets.
7. Our conclusion is that, from a low baseline, the Health Board has improved arrangements for ensuring data is valid and accurate, but they need to become more formalised and include approaches to provide assurance. We reached this conclusion because:
- there is commitment to improve data quality but governance and data quality assurance need to be further developed;
  - there are adequate data quality procedures and processes but policy needs to be formalised, and review and audit arrangements strengthened; and
  - our data analysis indicates the quality of data is adequate, but there are some areas for improvement.

## Recommendations

8. To help the Health Board move forward we have provided the following recommendations.

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### Data quality assurance

- R1 Introduce an annual report on data quality to provide organisational level assurance which covers the arrangements in place to ensure data quality, and the effectiveness of the arrangements.

### Data quality process

- R2 Agree and formally approve the data quality policy, and determine the required programme of work to effectively implement it.
- R3 Develop a formal programme of training which covers consistent application of data quality policies and procedures across sites.

### Data quality monitoring

- R4 Ensure that approaches for independent audit of data quality arrangements and testing are in place for key information areas. This audit work should be used to support assurance to the Health Board.
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# Summary report

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## **There is commitment to improve data quality but governance and data quality assurance need to be further developed**

### **The Health Board is aware of the importance of data quality and is committed to improving the data quality agenda**

9. Information governance and quality issues are complex and involve many different departments and professions. The Health Board established an Information Governance Committee which has met periodically over the last two years. This provides a basis for discussion of data quality issues, although its links to other committees and the Board for data quality assurance purposes are not yet formalised. The Health Board and its managers recognise that good data quality is business critical for planning, developing and delivering its services and provides appropriate arrangements to address information quality issues.
10. At the time of the fieldwork, senior management responsibility for data quality rested with the Director of Planning and the Director of Performance. The restructuring of the executive team will need to factor in delegated responsibilities for Data Quality effectiveness and assurance.
11. There are also responsibilities for data quality which rest with the Medical Director as Caldicott Guardian. Where responsibilities are split across Executives, there is always the risk that issues could be missed because managers are unsure how to escalate issues. To overcome this, the Health Board will need to ensure accountability and responsibility are clearly communicated and understood by all involved in data quality. The Health Board will need to monitor and periodically review its arrangements to ensure they remain effective.
12. Progress is being made to formalise arrangements and to strengthen and improve the data quality agenda. This commitment is reflected through focussed investment in specialist support staff.

### **The Health Board is starting to establish management groups which will consider data quality, but assurance to the Board is weak**

13. Data quality governance arrangements are not yet fully in place. The groups that looked at data quality in the past such as the Access 2009 group have been disbanded. There is no specific data quality forum. However, the Health Board is developing new management groups which will cover both cross-organisational data quality issues and also locality-specific areas. The groups are in the process of being

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established, and therefore we cannot comment on their effectiveness or how well they will report into the Information Governance Committee. These groups include:

- Data Standards Group (to be established);
- Business Logic and Development Group (to be established);
- Records Management Group (in place); and
- Clinical Coders Group, via Welsh Clinical Coders Group (in place).

14. It is important that these groups become effective and the Health Board should regularly receive updates on these arrangements until it is confident that they are firmly embedded and data quality issues, risks and governance are well managed.
15. Currently, there is no formal data quality annual report, as recommended in 2008 by the previous Minister for Health and Social Service. Data quality does feature in discussions on other forums but there is no clear reporting line to provide data quality assurance to parent committees or groups. Examples of these groups include the Locality performance meetings, Theatres Utilisation Group and Outpatients Group.

### **Data quality roles and responsibilities are in place but central information department resources are constrained and would be vulnerable if staff were to leave**

16. Data quality roles and responsibilities are in place, but resources are constrained in the central information management team. A formal role of a single corporate Data Quality Officer has not been created yet but operational accountability is clear and rests with the Head of Information. This position is however currently a secondment and, together with limited resources in the wider information team, creates vulnerability to staff loss and risk to the data quality agenda.
17. The current job descriptions in the information department refer to responsibilities for data quality. Accountability for data quality is being included in all new job descriptions across the Health Board where staff are responsible for recording patient and business information. In addition, we identified that all levels of staff and management interviewed were aware, and took responsibility for data quality in their day-to-day roles.

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## **Adequate data quality procedures and processes are in place, but the policy needs to be formalised and review arrangements strengthened**

### **There is no current approved data quality policy, but it is currently being drafted**

18. Currently, the Health Board does not have an agreed and approved data quality policy. However, the need for one is recognised and it is in the process of being developed although progress has been slow. The draft data policy covers the key themes to manage and improve data quality, including:
  - management of data quality;
  - responsibilities;
  - validation and data quality assurance;
  - policy review and monitoring arrangements;
  - compliance with national guidance and legislation; and
  - training and communications.
19. The draft policy scope effectively targets all instances of clinical and administrative information and secondary use of information within the Health Board, which includes:
  - patient administration and other operational services;
  - primary, intermediate, secondary and community care services;
  - performance management;
  - financial management services; and
  - planning and commissioning services.
20. The Health Board will need to ensure that the draft policy is formalised. In addition, technology and information governance issues rapidly change and the policy should be regularly reviewed to address new and emerging issues.

### **Data quality processes and procedures are in place but in some cases need updating**

21. To support data quality effectiveness with limited resources, national areas of importance are prioritised, such as NWIS data validation reports. This aligns with national guidance on data quality in Healthcare Standard 19. The Health Board also focuses on local areas and is proactive with close operational links between the information team and localities. This is an effective arrangement which supports day-to-day activity in service areas.

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22. Data quality processes and procedures are documented by service function. For example, the following processes are in place:
- documented process and training manuals, for example, booking processes, theatre processes and recording outcome sheets;
  - weekly submissions to the Welsh Demographic Service for NHS number pick-up;
  - liaison with GP practices in some areas, such as referrals and clinical procedures;
  - frontline staff checking patient details at clinics and over the phone; and
  - clinical coding.
23. A range of electronic systems support data quality validation, for example, pathology, radiology and Welsh Demographics System information. These systems enable staff to cross-verify and validate patient information, and should help improve the quality of patient data and administration.
24. Clinical-coding processes are good and centrally co-ordinated in Bronllys. The information department clinical coders undertake coding for all clinical procedures for all Powys hospitals and also for patients transferred into Powys for rehabilitation. Coding within the Welsh Government's 12-week standard currently stands at six to eight weeks.

### **Data quality communication arrangements are in place, but education and training approaches could be improved**

25. The Health Board uses a range of communication methods targeted at data entry staff and other professionals to promote improving data quality. The communication approaches include:
- written media such as emails, manuals, flash alerts at system logon, PAS update notices and referral to treatment guides; and
  - group and team sessions which promote data quality as part of the agenda.
26. General training for staff who use clinical and administrative systems has been weak, and there has been a reliance on line management and the information department to provide ad hoc training. There are training manuals and handouts for staff which refer to use of systems and data quality, but these are mixed and informal in nature. The need for a trainer was identified on a fixed-term contract, and in April 2011 the post was re-evaluated into a formal Data Integrity and Training Officer role. This post provides a reasonable training resource to support system users.
27. There are co-ordinated approaches for generic clinical-coding training which includes PAS and Validation at Source (VAS) training. Staff must attend a clinical-coding foundation course before they are allowed to undertake coding activity. There is a mandatory refresher course every four years and the training is co-ordinated by the NWIS training unit through a contract with 3M. Clinical coders are members of the All-Wales Clinical Coding User Group to share good practice. This group meets quarterly.

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## **There is effective and regular data validation but independent data quality audit, review and assurance arrangements are weaker**

28. The Board can only be assured on the quality of its information if there are effective feedback approaches to check the validity, accuracy, completeness and timeliness of the data which underpins it. Corporate monitoring and checking of performance information are regular agenda items of the locality performance meetings to check and discuss data.
29. There are effective arrangements to ensure the quality of data submissions to the Welsh Government. Validation At Source reporting is used to support the checking and testing of data prior to submission to central government. The Health Board does not use CHKS electronic monthly reports as this service is costly and, as Powys does not have a District General Hospital, a vast amount of the analysis is not required. Nevertheless, this does not present an issue because much of the acute-level information is recorded on systems out of county where clinical activity is delivered by other NHS providers. As an alternative, the Health Board uses the National Performance Framework (NWIS tool) which assesses similar targets to the CHKS model.
30. The development of clinical-activity-based costs (attributing costs to clinical episodes of care) depends on good data quality. Staff put significant effort into standardising and checking data emerging from PAS and other sources, both at corporate and operational levels.
31. There are also a number of less formal checks to support data validation and cleansing which have been brought about through initiatives, such as the Records Management Group project, to move to a 'single' patient record through culling and merging of case notes.
32. There are other internal feedback, monitoring and assurance approaches which help the Health Board to manage the quality of data. These include:
  - Patient Episode Database Wales (PEDW) data which supports validation, for example, of NHS numbers, LHB names and admitted patient care data.
  - The information department meets the Corporate Performance Group regularly to look at activity rates and breaches at an overview level. This helps verify performance data.
  - There are quarterly reports to the Information Governance Committee and a performance report to the Director of Performance which enables discussions on data quality and identifies areas for improvement.
  - In 2010, the Information Department was involved in the Referral to Treatment project which considered quality of data entry.
33. Data quality audits are not formalised and there is no evidence of ongoing external audit work on data quality aside from this Wales Audit Office review and the clinical-coding audit undertaken nationally in April 2010. In general, operational staff were not aware of any regular internal data quality audits although there have been some case-note check audits in the past. There are currently no plans to contract or

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commission any external experts to undertake a rolling programme of data quality audit or review.

## **Our data analysis indicates the quality of data is adequate, but there are some areas for improvement**

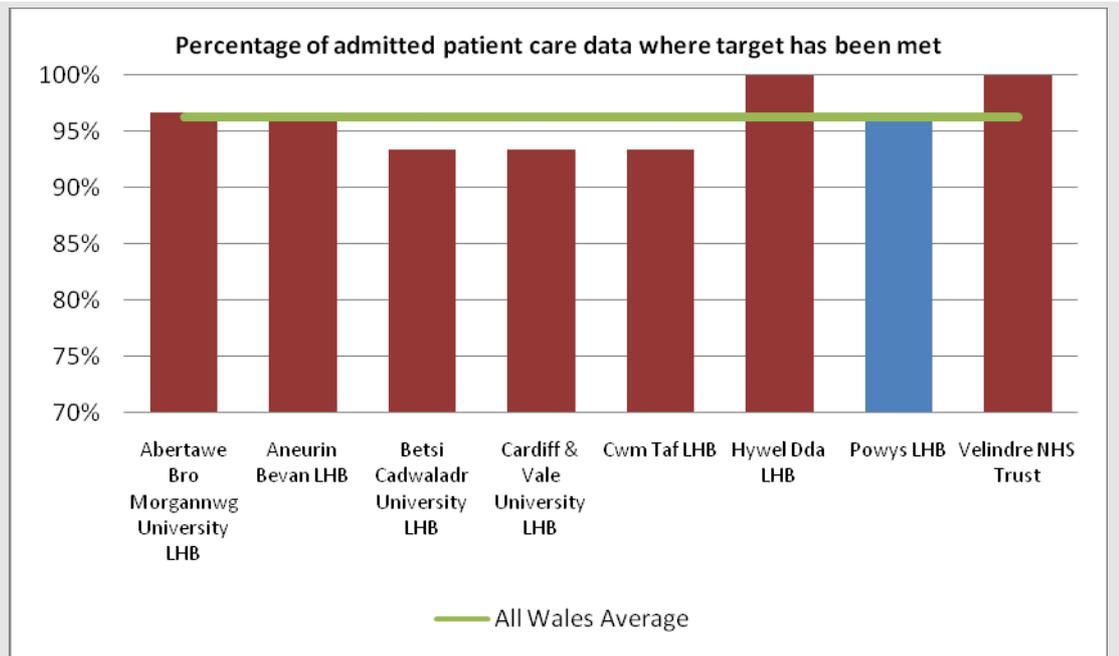
34. As part of our audit approach, we have considered and targeted our assessment of data quality performance where it is nationally comparable, and where we could relate findings to operational process effectiveness, and consequent clinical or business risk areas. This includes a review of the national data set validation reports and also electronic demographics data analysis of 8.5 million patient administration records and 5.2 million radiology administration records.
35. Our analysis, however, is narrow in scope in the context of the large number of clinical and business data sets held by the Health Board. Therefore the analysis can only be considered an indicator or proxy for the overall effectiveness of data quality arrangements in the Health Board.

## **The Health Board is generally meeting data validity targets for key data sets**

36. Across Wales, health boards submit data to NWIS which then undertakes validity checks. The results of this work are then communicated back to the health boards at regular intervals; usually monthly or bi-monthly.
37. We have reviewed the four data validity reports covering the period 1 April to 30 November 2011. These reports cover admitted patient care, outpatient referrals, outpatient activity, Accident and Emergency (A&E). The NWIS reports identify where a range of data fields have met the national validity standards. This information is summarised in Exhibits 1 to 4. We have presented the information to demonstrate the percentage of data items that have achieved these required standards. Although we recognise that there is no A&E department in Powys, we have included the national data for information (Exhibit 4).
38. Overall the exhibits indicate that the Health Board is meeting the majority of validity standards, and is performing at or above the Wales average. For example, Exhibit 1 indicates that the Health Board meets the national validity standards for 97 per cent of the data items checked within that dataset of admitted patient care.

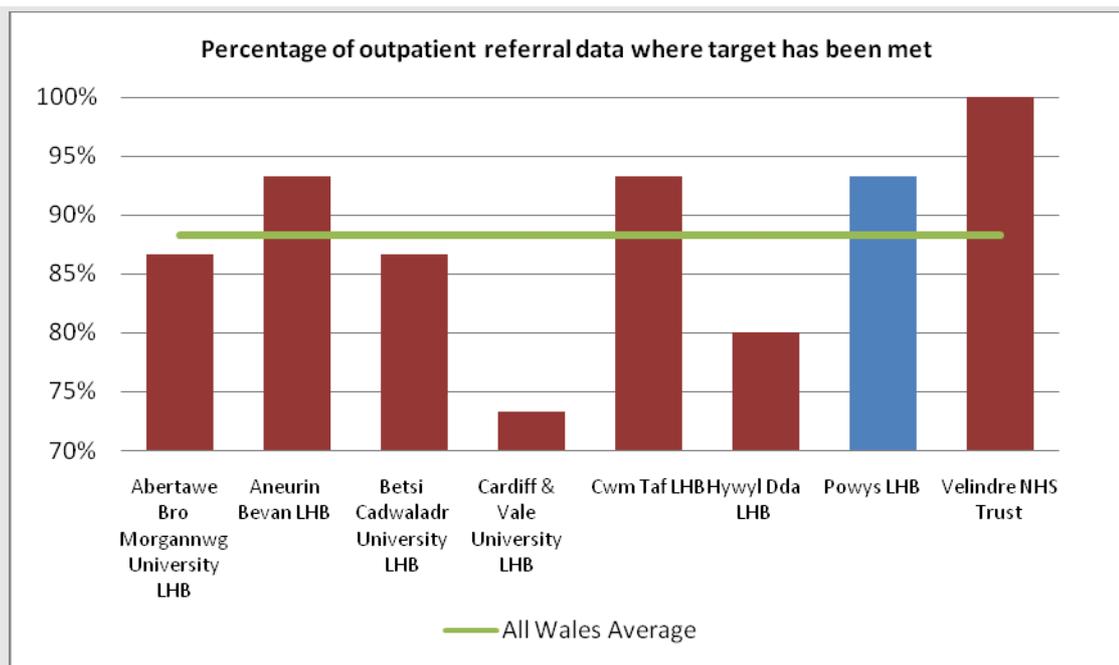
**Exhibit 1**

**Admitted patient care – dataset validity**



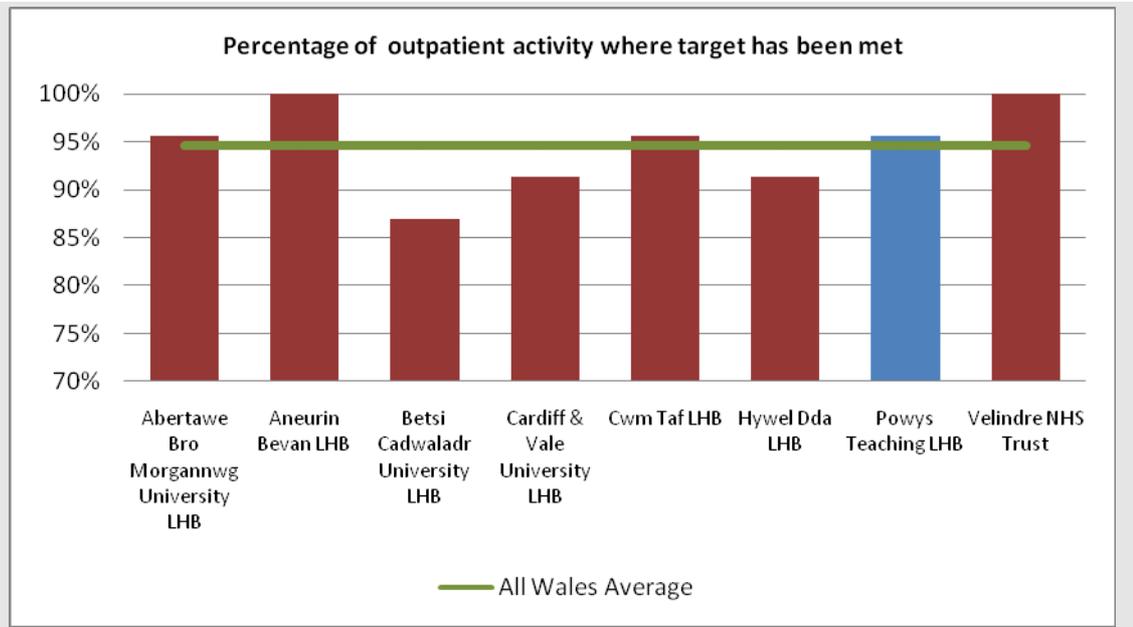
**Exhibit 2**

**Outpatient referral – dataset validity**



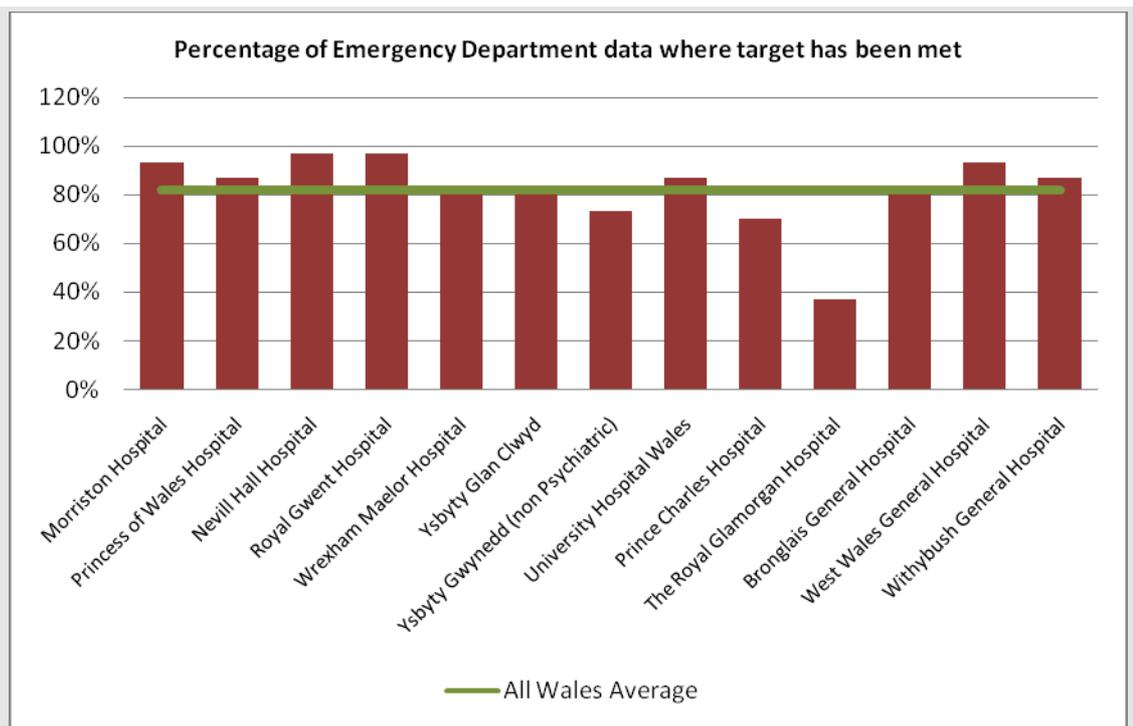
**Exhibit 3**

**Outpatient activity – dataset validity**



**Exhibit 4**

**Emergency Department – dataset validity**



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## **Our analysis of the patient administration system demographic data indicates reasonably effective controls are in place but records with no NHS number present a risk to the Health Board**

- 39.** A key building block of good quality data in the NHS is patient demographic information, for example, name, address and date of birth. Separate patient information systems are often in use across different hospitals and departments. This means that a patient who has received care in a number of different settings can have numerous records and identifiers. In such a scenario, all the clinical information about that patient is unlikely to be held in one place creating potential clinical safety risks and making it more difficult to locate the right records for the right patient.
- 40.** In addition to considering the arrangements for achieving data quality as discussed in the earlier sections of this report, we undertook demographic data testing. Our testing approach is designed to support our assessment of the Health Board's data quality arrangements, by looking at an indicator of good quality data. We analysed the core demographic patient data held on the PAS to assess the extent of duplicate entries, or cases where patient identifiers are missing. The key findings from this work are that:
- The patient demographic data held on the PAS has 3,000 (1.3 per cent) total duplicate NHS numbers. This indicates reasonable approaches to cleansing and will help minimise error, risk and inefficiency, although ideally there should be no duplicates.
  - 18,623 (eight per cent) patient records on PAS have no NHS number. Taking into account legacy and overseas patient records there should still only be a limited number of new patients without NHS numbers. This performance suggests there are potential clinical risks in identifying the correct patient records. However, this may also present a financial cost because the Health Board can only charge other health boards and English trusts for services provided to their patients where the NHS number allows them to be identified.
- 41.** The findings above align to our review of the data quality processes in place which includes the Health Board's recent and ongoing IM&T and informatics work. The findings reflect the effectiveness of past work to improve key data in preparation for the implementation of the PAS system known as Myrddin in Powys (MiP). While our data analysis does not suggest significant risk to the Health Board, there may be both clinical risk and business inefficiency arising from patients with no NHS number, as mentioned above. Areas for improvement should be incorporated into existing master patient index project plans and cleansing processes. Further details on our data testing results are provided in Appendix 1.

# Appendix 1

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## Patient demographic data analysis results

As part of the data quality fieldwork, the Wales Audit Office undertook an analysis of PAS patient demographic data. This appendix provides a summary of our findings.

The table below identifies key relevant statistics from our records analysis. We have also included a set of charts which provide an indication of the data quality in the Health Board.

Indicator	Powys THB	Wales
Total number of electronic patient records (patient administration system) in Powys LHB	230,771	8.5 million
Total number of multiple registrations only in Powys	3,000 (1.3%)	6.2% (average)
Total number of records with no NHS number recorded	18,623 (8%)	1,150,090 (total) 16% (average)
Total number of multiple registrations in Powys across all-Wales sites (which reflects patient travel to out-of-county NHS providers)	115,561 (50%)	48% (average)

Well-controlled and clean demographic information is a pre-requisite for a good level of overall data quality. The indicators we evaluated above and presented in the graphs which follow, generally compare favourably with the rest of Wales. Nevertheless, these issues may still present clinical risk because patients' case notes may be duplicated, and treatment may be based on only partial case history. Records with no NHS number are more difficult to track and trace and this may have a financial impact, because the Health Board may not be able to re-charge other health boards appropriately.

In examining multiple registrations in the PAS system, we found that the PAS had very low instances of multiple registrations (1.3 per cent) which is amongst the lowest in Wales (lower is better). This means that the Health Board has had some success in removing unnecessary duplicates and so reduces the risk of its own records containing only partial information.

A further complication is the number of records held without an NHS number, which in Powys is still relatively low at 18,623 (eight per cent), half the Welsh average of 16 per cent. Not having a valid NHS number makes patient tracing more difficult and can prevent the Health Board recovering treatment costs for visiting patients.

**Chart 1 – (PAS) Patients with several different identifiers**

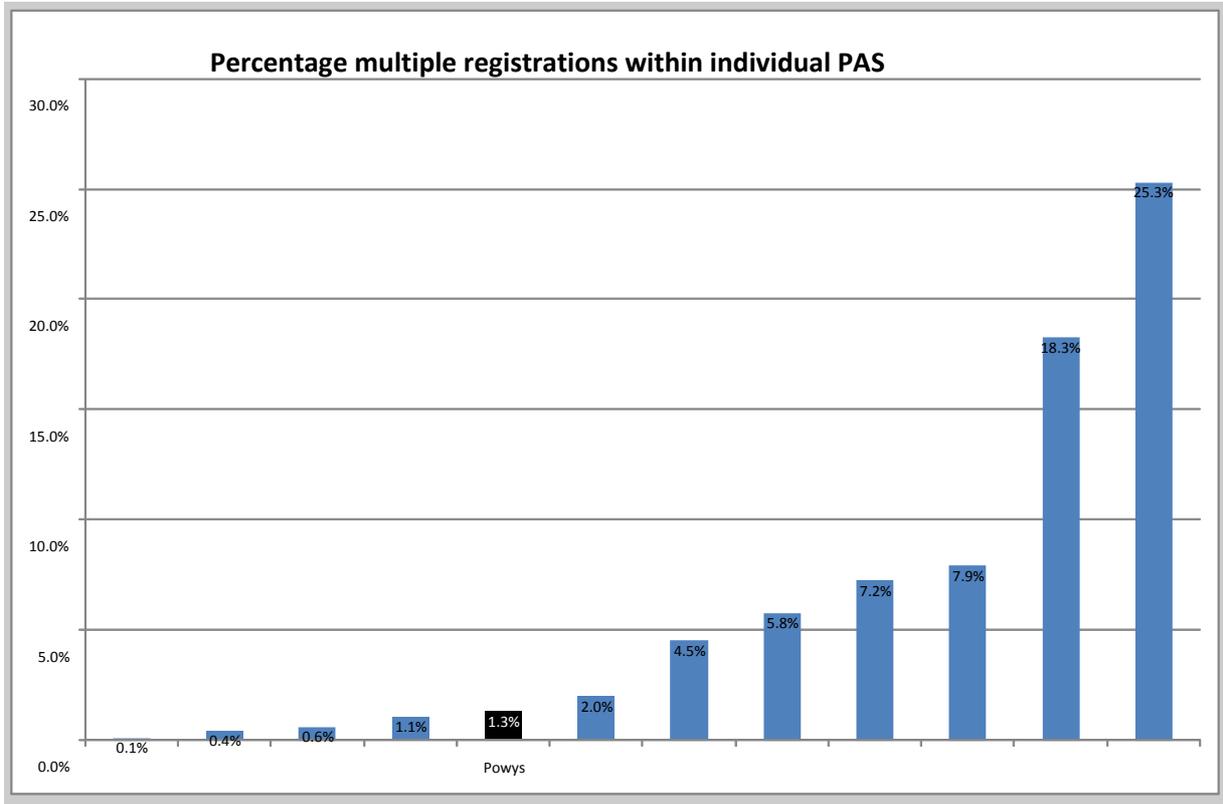


Chart 1 identifies the multiple registrations, but with different identifiers within a single system. This means that there are instances of individual patients with more than one electronic record at a single site. This may present a clinical risk if the patient also has duplicate written case notes. The chart indicates that the Health Board has 1.3 per cent multiple registrations of the same patient (identified by a duplicate NHS number or a match of name and date of birth) which equates to an actual number of 3,000. Other health boards in Wales are anonymously included, and Powys compares favourably to these.

**Chart 2 – (PAS) Patients with no recorded NHS numbers**

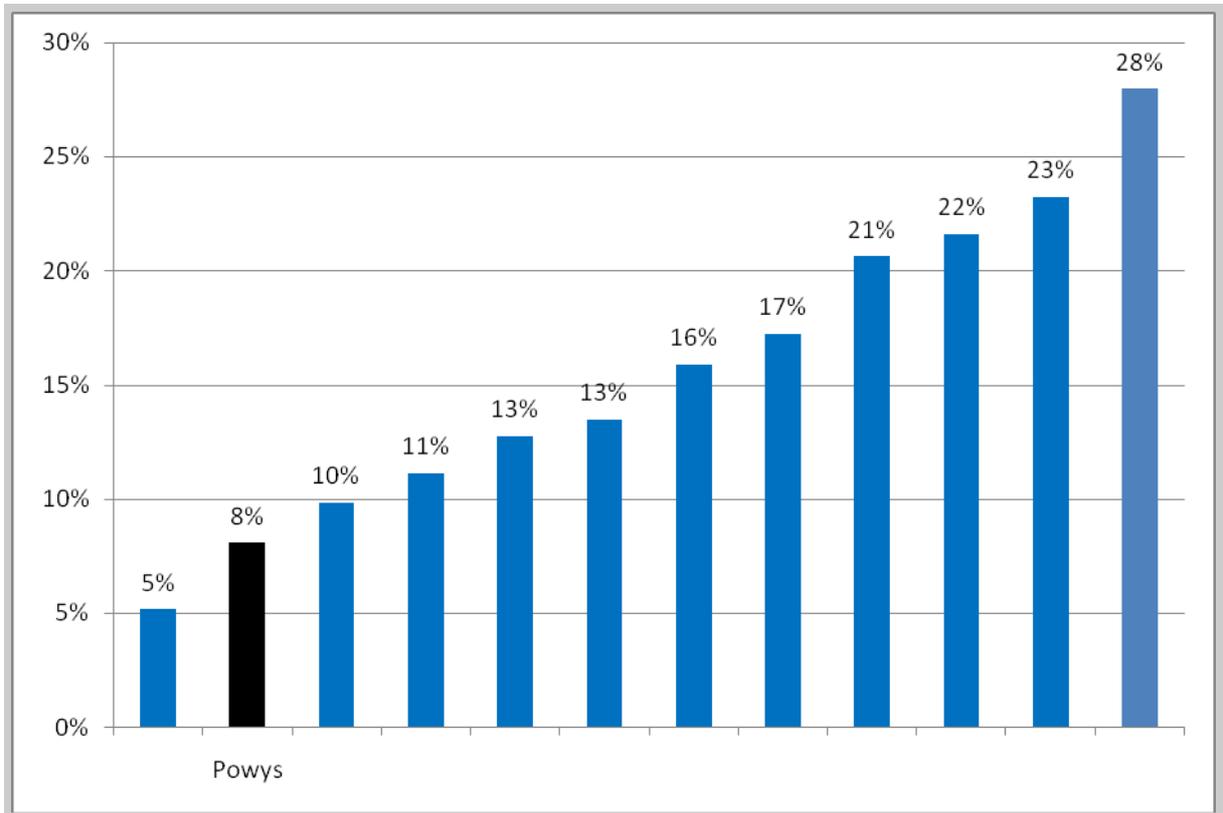


Chart 2 identifies the incidence of records with no NHS number between different PAS systems across Wales. While it is still possible to identify patients by their personal details, or using existing hospital numbers, these methods are less precise than using NHS numbers; personal details may be unclear or unavailable, and there have been a number of hospital number systems used across Wales. Furthermore, the lack of an NHS number can have a financial impact, in that health boards cannot recover treatment costs associated with patients from other health boards in Wales or in the rest of the UK without quoting the NHS number.

**Chart 3 – (PAS) Duplicate NHS numbers**

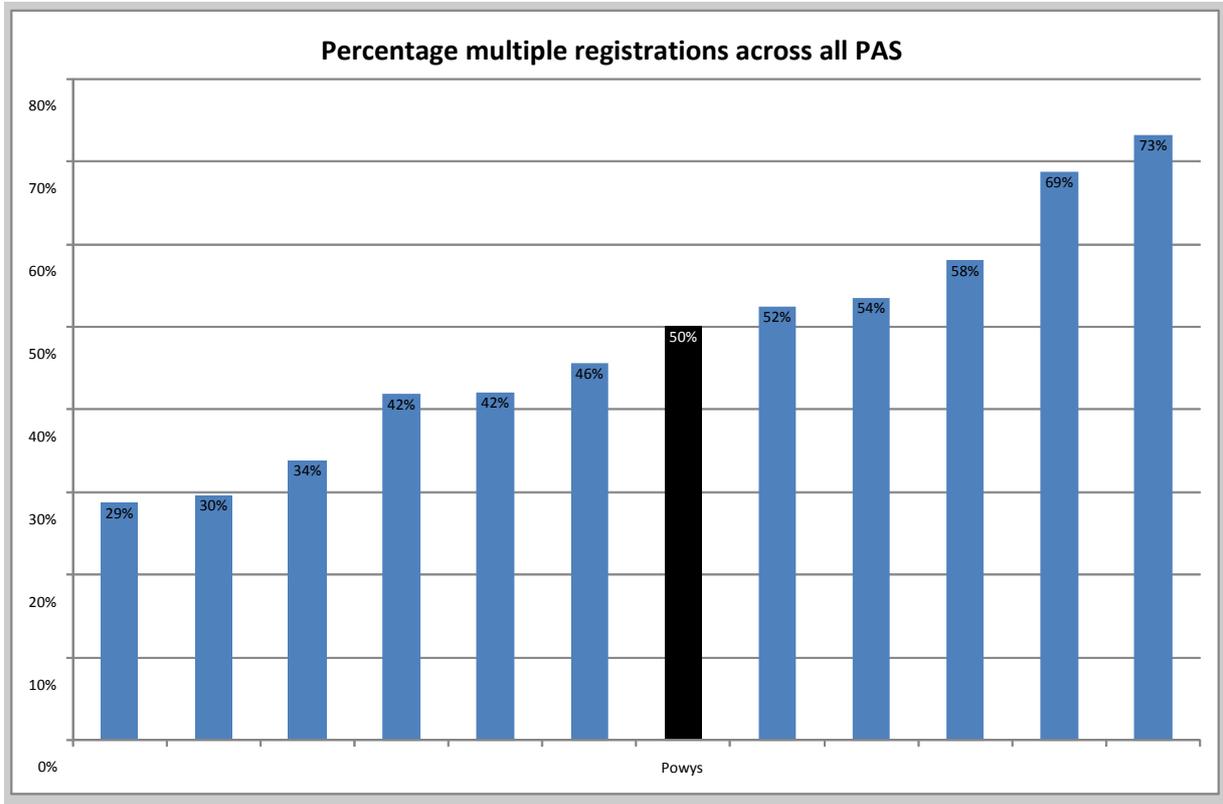


Chart 3 identifies the multiple registrations of NHS number identifiers between different sites across Wales. This means that a single patient has only one NHS number associated with them, but there is more than one instance of the NHS number recorded across all Welsh sites. This may indicate a degree of clinical risk, in that multiple, different written case notes may exist in different hospitals, but the numbers here generally indicate the legitimate natural patient flow between sites.





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