



Combined follow up of Informatics and Communications Technology audits

Aneurin Bevan University Health Board

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The person who delivered the work was Andrew Strong.

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Summary

1. The Wales Audit Office has previously undertaken a number of reviews covering aspects of Informatics and Communications Technology (ICT) at Aneurin Bevan University Health Board (the UHB). These included:
 - Data Quality (2012);
 - IT Disaster Recovery and Business Continuity (original 2009 review and follow up in January 2012); and
 - Caldicott arrangements (2013).
2. Each review highlighted a number of areas for improvement, with the key conclusions as follows. Exhibit 1 summarises the key conclusions from the previous reviews.

Exhibit 1: Key conclusions from previous ICT reviews

Review name and date	Key conclusions
Data quality (2012)	The Health Board demonstrates a good standard of data quality, however complex governance arrangements present a potential barrier to improvement.
IT disaster recovery and business continuity (2009 and 2012)	Although not all the recommendations we made in our previous report in 2009 have been acted upon, the Health Board has made some progress in strengthening its ICT disaster recovery and business continuity arrangements.
Caldicott arrangements (2013)	Whilst the Health Board appears to have appropriate management and planning arrangements to underpin Caldicott governance requirements and has approached planning based on a good understanding of information confidentiality responsibilities, the UHB needs to strengthen its Caldicott arrangements to ensure they are fully effective.

3. This follow up review assesses progress made against recommendations made in our previous reviews and sought to answer the question: **‘Has the Health Board made progress in addressing the key issues and recommendations highlighted in our previous reports relating to IM&T matters?’**
4. We concluded that the UHB has made progress in some areas raised in previous reviews but further improvements are needed such as approving the e-Health strategy, improving the accuracy of information and testing business continuity plans.
5. Our detailed assessment of progress against previous recommendations is set out in the main body of this report and, for each of our past reports, is summarised on the following page.

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- 6. Review of Data Quality** - Whilst information governance arrangements and the updated data quality policy provide the foundations to improve data quality, challenges remain to improve the accuracy of the UHB's information; Information governance arrangements are in place through the Information Governance Committee (IGC) and Information Development Group (IDG) to ensure data quality issues remain on the UHB's agenda:
- The UHB has established an Informatics Annual Report which has been approved by the Executive Team and was presented to the IGC in April 2014. The Annual Report recognises the reliance on timely, accurate and appropriate information to support the UHB's monitoring, performance, planning and governance arrangements.
 - The UHB has updated and agreed a Data Quality Policy which establishes a formal responsibility for data quality on all staff, confirms the role of the IGC and IDG for monitoring data quality and identifies specific corporate roles with an information management accountability.
 - The UHB faces challenges to improve the accuracy of the information it uses and these include embedding personal staff ownership and accountability for data quality, improving resources for and accuracy of clinical coding and strengthening data standards and validation.
- 7. Review of IT disaster recovery and business continuity** - The UHB has a standard approach to disaster recovery and business continuity planning, although the testing of business continuity plans is limited and there is scope to strengthen the approach in some divisions:
- The UHB has a second main data centre at Ysbyty Aneurin Bevan (YAB) that provides some resilience in the event of an incident with the main Mamhilad data centre.
 - The UHB has IT disaster recovery plans in place, however these remain largely untested to provide assurance they work as intended. The UHB have instead provided an alternative solution to testing backup arrangements and plans. All of the UHB's critical IT systems, except for Masterlab and Telepath pathology systems, are replicated at least daily from the Mamhilad data centre to the YAB data centre off-site.
 - In addition, those less critical UHB IT systems that are not replicated off-site but are backed up to storage area network devices which are themselves backed up real-time to another storage area network device located off-site at YAB.
 - The UHB has produced a three year rolling Informatics medium term plan (IMTP) to prioritise investments to maintain and improve the UHB's IT systems and infrastructure. A capital funding plan has been agreed and monies allocated for 2014-15. As at April 2015 the 2015-16 capital funding plan has not yet been agreed.
 - The UHB has developed an approved Business Continuity Management Policy to require a standard approach and emphasise the divisional responsibility for establishing effective business continuity arrangements.

- Business continuity plans have been developed by some Divisions although not all of these are fully completed and some business continuity plans have not been tested.

8. Review of Caldicott arrangements - Caldicott arrangements are well developed at the UHB, but there is scope to make further improvements by agreeing the UHB's updated strategic approach to information governance which is included in the draft e-Health strategy, completing the information governance steward development programme and informing patients of the use of their information:

- the UHB's Caldicott self-assessment shows improvement on the 2013 79 per cent Caldicott compliance level with 82 per cent compliance reported to the Executive in April 2015;
- the UHB's current Information Governance Strategy expires in early 2015 and this has been updated and combined into the draft UHB's e-Health Strategy 2014-2019 which is currently awaiting Executive approval;
- the information governance steward programme is progressing well although work remains ongoing to identify the level of stewards required and to ensure all service areas are appropriately represented; and
- the UHB have drafted a new poster and leaflet campaign to commence in April 2015 for informing patients about the use of their information.

Recommendations

- 9.** Further details on our findings of this combined IT follow up and progress made against previously reported improvement actions can be found in the detailed section of this report.
- 10.** The UHB should continue to implement our recommendations that have not been completed since our previous reviews. We have also made the following new recommendations.

Data quality

- R1 Ensure the UHB meets the Information Governance and Confidentiality e-learning training target of 80 per cent staff completion.

IT disaster recovery and business continuity planning

- R2 In conjunction with NWIS and the national LIMS supplier, the UHB should develop and implement a plan to transition from the legacy Masterlab and Telepath pathology systems to the National LIMS system located in the national Data Centres.
- R3 Document a systems resiliency map to assess all the local IT systems used by the UHB to map the availability, backup and restoration arrangements and procedures in place.
- R4 Report the systems availability map to the IGC to provide assurance that UHB's IT systems and information are appropriately resilient.

Caldicott review

- R5 Ensure the Information Governance team is appropriately resourced to support information confidentiality training and education programmes for example, poster and leaflet campaigns and tailored information governance training.
- R6 Establish an appropriate target for the number of Information Governance Stewards required to lead on information governance compliance throughout the organisation. This should take into account the support and training required for Information Governance Stewards. Ensure all Service areas are appropriately represented by Information Stewards, for example, Community Services.
- R7 Where staff have access to a computer with an in-built writable cd/dvd drives, these staff should be reminded of the UHB's IT security policy requirements and the consequences of breach this policy.

Informatics for the whole UHB

- R8 Ensure the e-Health Strategy 2014-2019 is approved by the Executive Board and that it is appropriately resourced.

Detailed report

Assessment of progress

11. The tables below list the recommendations from our previous reviews and give our opinion on whether the recommendation has been fully implemented (✓), partially implemented (✓/✗) or not implemented (✗).

Whilst information governance arrangements and the updated data quality policy provide the foundations to improve data quality, challenges remain to improve the accuracy of the UHB's information

Reference	Implemented?	Recommendation	Summary of progress made
Review of Data Quality			
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.	<p>The UHB has established an Informatics Annual Report which is approved by the Executive Team. The Informatics Annual Report for 2013-14 was presented for assurance to the IGC in April 2014. The UHB recognises in the Annual Report the reliance on timely, accurate and appropriate information to support the monitoring, performance, planning and governance agenda.</p> <p>The Annual Report covers the arrangements in place to help ensure data quality through the IDG and its data quality sub-groups. The IDG meets bi-monthly to provide direction and standardisation of information systems and protocols. The sub-groups managed by the IDG include Divisional representation and are designed to improve the quality of data within the UHB's information systems. The IDG has an annual work programme to improve business intelligence and performance reporting and in 2014 this includes the development of performance dashboards and ward bed tools.</p>

Reference	Implemented?	Recommendation	Summary of progress made
R2	✓/x	Ensure that Information Governance arrangements are efficient, effective and appropriately include data quality on the agenda.	<p>The UHB has a high reliance on clinical staff to enter information correctly. Whilst the UHB's data quality and coding accuracy is not at target levels and this has been evidenced through recent health records audits, the IGC and IDG provide the governance arrangements to help ensure that data quality remains on the agenda. The Information and Information Governance teams provide support and direction to clinicians to help raise the accuracy of the UHB's information and maintain data quality at a clinician level.</p> <p>Key challenges acknowledged by the UHB and areas of improvement for data quality in 2015 include:</p> <ul style="list-style-type: none"> • embedding the personal ownership, accountability and responsibility for data accuracy within clinicians to increase engagement with data quality matters; • increasing data quality by improvements in data standards, system validation and design through the standardisation of data items, data tables and datasets; • targeted education and training for those staff that enter and key-in data to UHB information systems; and • improving clinical coding levels through providing additional coding resources.

Reference	Implemented?	Recommendation	Summary of progress made
R3	✓	<p>Incorporate data quality into the induction process or training for all new starters who have responsibility for inputting, analysing or amending clinical and business data. Provide data quality refresher training as required.</p>	<p>The UHB has an induction training process for all new starters which includes an introduction to data quality matters. The UHB also has a mandatory e-learning training programme for all staff to complete every two years. All UHB line managers are responsible for and monitor staff completion of the e-learning package modules.</p> <p>The UHB's information confidentiality training is largely delivered through an e-learning package although targeted classroom based training is also available for those staff who input, analyse or amend clinical data. Staff compliance to the completion of the information confidentiality training was reported to the IGC in the April 2014 Annual Report on Information Governance at 75% of staff against a UHB target of 80% completion.</p>
R4	✓	<p>Ensure that the Data Quality Policy is updated:</p> <ul style="list-style-type: none"> • the scope should cover all aspects of the Health Board; • the policy should identify all relevant committees and reflect their terms of reference; and • roles and responsibilities should reflect current actual arrangements. 	<p>The UHB has updated the Policy for ensuring Data Quality' (Data Quality Policy) in June 2014. The Data Quality Policy was approved by the Executive Board and is due for next update in June 2017. The Data Quality Policy is available for all staff to access on the UHB's intranet and includes:</p> <ul style="list-style-type: none"> • the scope of the policy covers all staff who input information to patient based systems; • a policy statement in relation to the management of data quality; • responsibilities for staff in relation to data quality, for example, Divisional Directors, staff line managers and Head of Health Records; • responsibilities for specific corporate roles with an information or data quality responsibility, for example, Director of Performance and Improvement, Head of Information and Head of Information Governance; and • responsibilities of UHB Committees and groups involved in ensuring data quality, for example, the IGC and the IDG.

The UHB has a standard approach to disaster recovery and business continuity planning, although the testing of plans is limited and there is scope to strengthen the approach in some divisions

Reference	Implemented?	Recommendation	Summary of progress made
Review of IT Disaster Recovery and Business Continuity - recommendations from the 2009 report			
R1	✓	Produce a prioritised and funded investment plan to modernise the Health Board's ICT infrastructure and improve its resilience.	<p>The UHB has produced a rolling three year IMTP. The IMTP for 2015 – 2018 has been presented to the February 2015 IGC for assurance. The IMTP plan aligns the local UHB informatics deliverables and priorities to the national initiatives and provides a summary of the informatics refresh or investment plans to maintain and improve the UHB's IT systems and infrastructure. In addition the UHB's Informatics department has produced a five year capital investment plan which includes the three year IMTP and an additional two year capital funding plan.</p> <p>The February 2015 IGC received the Informatics Capital Funding progress update on the £865,000 2014-15 allocated capital funding and the requested 2015-16 requirements submitted in the IMTP. The UHB have a risk assessment process in place to target priority areas for capital investment for the maintenance of its existing IT services and support strategic informatics improvements. The UHB Informatics Department acknowledges the challenges securing informatics capital funding against other priorities in the capital funding process. As at April 2015 the 2015-16 capital funding plan has not yet been agreed.</p> <p>The three year rolling IMTP is updated annually with approval sought for the current year IT modernisation proposals within the available capital resource budgets. The Informatics Department plan to produce the IMTP annually to identify the IT infrastructure refresh required given the funding available to modernise the Health Board's ICT infrastructure and improve its resilience.</p>

Reference	Implemented?	Recommendation	Summary of progress made
R2	✓	Establish a second main computer room so that the Trust is not reliant on one main computer room. Secondary servers can be located in this second data centre for resilience. This can also be used as a DR facility to recover systems in the event of a disruption to ICT services.	<p>The UHB have put in place a secondary data centre at the YAB Hospital. This provides a second computer room so that the UHB is not wholly reliant on the main Mamhilad data centre. The secondary computer room can be used a part of the UHB's IT disaster recovery plans in the event of an incident that affects the Mamhilad data centre.</p> <p>A number of the UHB's critical IT systems are replicated from the Mamhilad data centre to YAB, for example, Clinical Workstation (CWS) and the Myrddin PAS. The UHB have also located a second Storage Area Network (SAN) in the YAB data centre which is used for a real-time backup of those local UHB systems stored on the Mamhilad SAN and not replicated to YAB.</p>
R3	✓/x	Test the DR plans to ensure they work as intended and are fit for purpose. This test should be performed at least annually.	<p>The UHB does not perform an annual planned or scheduled full IT disaster recovery test. The Informatics department have not planned an IT disaster recovery test due to the operational availability requirements of many of the UHB's critical IT systems. A small number of IT systems and infrastructure are failover tested in isolation to others, for example, the UHB's CWS is failover tested approximately every six weeks as a new software release is applied to CWS by the UHB. Some restorations of IT systems and data have occurred in 2014 from backups but these are unplanned operational restores in response to a system availability issue and these do not form a fully planned IT disaster recovery test. Therefore, some components and elements of the UHB's IT disaster recovery plan have been tested, but not as part of a full IT disaster recovery test.</p>

Reference	Implemented?	Recommendation	Summary of progress made
			<p>The UHB have taken a number of actions to mitigate this risk above and provide an alternative solution to testing backup arrangements and plans. All of the UHB's critical IT systems, except for Materlab and Telepath pathology systems, are replicated from the Mamhilad data centre to YAB. This network replication is daily. As noted above, those less critical UHB IT systems that are not replicated are backed up to SAN devices which are themselves backed up real-time to another SAN located off-site at YAB.</p> <p>The UHB aim to produce a map of those IT systems that are covered by replication, and identify for those that are not the availability arrangements in place to provide assurance that the information is available to restore from backups and that plans work as intended.</p> <p>The UHB should plan with NHS Wales Informatics Service (NWIS) the timescales for the migration from the legacy Masterlab and Telepath pathology systems to the National Data Centre infrastructure and national pathology systems.</p>

Reference	Implemented?	Recommendation	Summary of progress made
R4	✓/x	Strengthen the environmental controls over the main computer room.	<p>The UHB have made a number of changes in 2014 to strengthen the environmental controls over the main Mamhilad computer room. These include:</p> <ul style="list-style-type: none"> • A new Uninterruptible Power Supply (UPS) has been installed in a room immediately outside of the main data centre room which helps reduce the power consumption and use of air conditioning within the main room. The UPS protects the data centre hardware from unexpected disruptions in the power supply. A new air conditioning unit has been installed outside of the main data centre in the UPS room. • An additional power unit with connection to a separate power circuit has been installed within the main computer room to allow portable air conditioning units to be used if required. • The environmental alarm system has been recently upgraded for out of hour's alerts to Informatics Department staff. The new system has dual path signalling via both traditional telephone and via 3G communications which allows for improved resilience in messaging if the temperature or environmental alarms are triggered. <p>The UHB plan to install four air conditioning units within the data centre by early April 2015. These will replace the ageing air conditioning units currently used.</p> <p>However, the fire escape route which passes through the Mamhilad computer data centre is still located within the room.</p>

Review of IT Disaster Recovery and Business Continuity – Recommendations from the January 2012 report

Reference	Implemented?	Recommendation	Summary of progress made
R1	✓	Build upon current arrangements by bringing together the information from risk registers, environmental standards and other ICT infrastructure documentation to establish an investment plan.	The Informatics Department manage an IT risk register that is regularly updated. This includes risks relating to the resilience of ageing or end of life IT infrastructure and systems. To mitigate these risks the UHB have prioritised the replacement of IT infrastructure when funding becomes available and produce a three year rolling IMTP to make capital resource bids for IT infrastructure replacement. However, the availability of capital funding remains an issue which places greater importance on the risk management and prioritisation of the UHB's resources.
R2	✓/x	Prepare a schedule of DR testing applicable at least to key financial and clinical systems.	See recommendation 3 above from July 2009. The UHB has not scheduled the performance of an annual planned full IT disaster recovery test. Some IT systems are IT Disaster Recovery tested in isolation to the rest of the IT systems used. The UHB have taken a number of actions to mitigate this risk and provide an alternative solution to testing backup arrangements and plans, instead all of the UHB's critical IT systems are replicated from the Mamhilad data centre to YAB. In 2015-16 the UHB plan to document a systems resiliency map under Service Management principles of all the IT systems it uses and the availability and restoration procedures that are in place, this will help identify any improvement actions required in developing availability plans and improving these.
R3	x	Review the current fire escape route which passes through the Mamhilad computer room and is a significant ICT risk. Arrangements need to be strengthened by, for example, re-routing the fire exit.	The UHB have not moved the fire escape route which passes through the Mamhilad computer data centre and it is still located within the room. The UHB's Fire Officer has assessed the fire escape route and although alternative fire routes have been assessed the route has not been altered. Controls are in place over the CCTV of the entry and exit doors to the Mamhilad data centre room and access to the server racks is controlled with key access required to each rack. The Informatics Department have risk assessed these arrangements and believe the controls in place partially mitigate the risk.

Reference	Implemented?	Recommendation	Summary of progress made
R4	✓/x	Complete and approve any outstanding business continuity plans and ensure that they are based on a standard agreed template and reflect the appropriate level of risk. Regularly test and update all business continuity plans.	<p>The UHB has developed a Business Continuity Management Policy and was approved by the Executive Board in March 2014. Each Division of the LHB is required to perform a risk assessment to prepare and complete a business continuity plan. Business continuity plans include the use of suggested guide template and action card model to standardise plans.</p> <p>Developing a comprehensive and up-to-date programme of business continuity plans across all of the UHB is a time consuming task and a Business Continuity Management Group has been established to oversee this programme. Work remains ongoing within the UHB's Divisions to develop all of the business continuity plans required, for example, in Family and Therapies and Mental Health.</p> <p>All business continuity plans are required by the policy to be reviewed and amended at least annually or earlier if required. Whilst some of the business continuity or emergency plans have been periodically tested, for example, in Accident and Emergency, work remains ongoing to test all of the UHB's business continuity plans.</p>
R5	✓	The Health Board should emphasise organisational and departmental management responsibility for developing appropriate business continuity arrangements to cover the possibility of systems failure.	The UHB has clearly emphasised the Divisional responsibility for completing business continuity plans in the Business Continuity Management policy. Each UHB Division is required to have a designated and responsible officer for overseeing the Divisional contingency planning arrangements.

Caldicott arrangements are well developed at the UHB, but there is scope to make further improvements by agreeing the updated UHB's information governance strategy, completing the information governance steward development programme and informing patients of the use of their information

Reference	Implemented?	Recommendation	Summary of progress made
Review of Caldicott arrangements			
R1	✓/x	The current arrangements for informing patients about the use of their information needs updating.	<p>The UHB's Information Governance manager is currently drafting the new poster and leaflet campaign which will include fair processing notices to inform patients about the use of their information. It is planned to address not just issues of patient information confidentiality but also information quality matters. The UHB acknowledge that these posters and leaflets will need to be widely distributed around all of the UHB, including the main Hospitals focussing on clinics and wards and community services. The UHB plan to update and draft the new poster and leaflets by the end of March 2015 ready for distribution in April 2015. Once completed it is intended to add these to both the staff intranet and the UHB's website.</p> <p>The UHB's Information Governance function only has a budget for the information governance team staff's time and has no budget for any poster or leaflets campaigns. The cost of printing the leaflets and posters in early 2015 has been funded from an efficiency saving made from the early retirement of the member of the Information Governance team. The UHB should allocate an appropriate amount of budget to the Information Governance team to support information confidentiality training and education programmes.</p>

Reference	Implemented?	Recommendation	Summary of progress made
R2	✓/x	Increase the number of Information Governance Stewards.	<p>The UHB's 2013 Caldicott self-assessment produced a score of 79% compliance to Caldicott requirements. The UHB have completed the 2014 Caldicott self-assessment with continuous improvement shown with a compliance level of 82%. The UHB's Executive team approved the 2014 Caldicott self-assessment in April 2014. The UHB's current Information Governance Strategy expires in quarter 2 2015 and this has been updated and combined into the draft UHB's e-Health Strategy 2014-2019 currently awaiting Executive team approval.</p> <p>The UHB have commenced a development programme to establish a network of Information Governance Steward's to help improve its compliance to Caldicott requirements. The Information Governance Steward position is with managers who enable UHB staff to perform their job function with proper regard for information confidentiality requirements. The Information Governance Steward role is not a formal UHB role but is regarded as a 'supervisory position' with their existing managerial job function.</p> <p>The number of Information Governance Stewards has increased from 60 in early 2013 to 170 in early 2015. The UHB has a rolling programme to develop the Information Steward network across the UHB's service areas, for example, Mental Health and Health Records. The UHB acknowledge that the development of the Information Governance Steward network is a long process and at present not all service areas are sufficiently represented with further work to develop Information Governance Stewards needed in Community Services. The UHB has not set a target for the number of Information Stewards it requires to appropriately support all medical and administrative staff. Although the UHB recognises that the number of Information Governance Stewards needed due to the support and training required will need to be realistic.</p>

Reference	Implemented?	Recommendation	Summary of progress made
			<p>The UHB's focus on disseminating the good practice Caldicott principles has started to evolve from establishing appropriate information confidentiality requirements to appropriate information sharing through its partnership working arrangements. This includes the ways it can improve information integrity and data quality.</p>
R3	✓	<p>Strengthening the use of encryption and completing the encryption programme for all PC desktops and laptops, and extending this to include pen drives and USB sticks.</p>	<p>UHB laptops and desktop machines are encrypted by McAfee software through the Welsh NHS encryption solution. The UHB has commenced the roll out of Windows 8 to desktops and laptops and these are protected by Microsoft Windows Bitlocker Administration and Monitoring (MBAM) encryption. The UHB plans to roll-out MBAM encryption to all new Windows 2007 machines. All UHB laptop and desktop hard drives are protected at the Advanced Encryption Standard (AES) 256 bit encryption level.</p> <p>The UHB's Information Security Policy requires the use of encrypted USB drives to allow full read and write capability and appropriate information storage. The UHB's Information Security Policy requires all USB devices used to have AES 256 bit encryption. These can either be supplied by the Informatics department or they can recommend the USB's for UHB departments to procure. A 'complex' strength password is needed to access the USB and after six failed access attempts the USB data is erased. A technical solution by Sophos Anti Virus end point security software is in place to prevent the writing of data to an unencrypted USB devices, this only allows read only access to data from an unencrypted USB.</p> <p>Whilst the Information Security policy prohibits personal information to be stored on unencrypted removable media, there is no technical solution in place to prevent UHB staff writing personal information to either desktop or laptop machines that have in-built cd drives. UHB staff should be reminded of the UHB's IT security policy requirements where staff have write access to those computer machines that have in-built cd drives.</p>



WALES AUDIT OFFICE

SWYDDFA ARCHWILIO CYMRU

Wales Audit Office
24 Cathedral Road
Cardiff CF11 9LJ

Swyddfa Archwilio Cymru
24 Heol y Gadeirlan
Caerdydd CF11 9LJ

Tel: 029 2032 0500

Ffôn: 029 2032 0500

Fax: 029 2032 0600

Ffacs: 029 2032 0600

Textphone: 029 2032 0660

Ffôn Testun: 029 2032 0660

E-mail: info@wao.gov.uk

E-bost: info@wao.gov.uk

Website: www.wao.gov.uk

Gwefan: www.wao.gov.uk