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Follow-up Information Backup, Disaster Recovery and Business Continuity, and Data Quality: Update on Progress – **Hywel Dda University Health Board**

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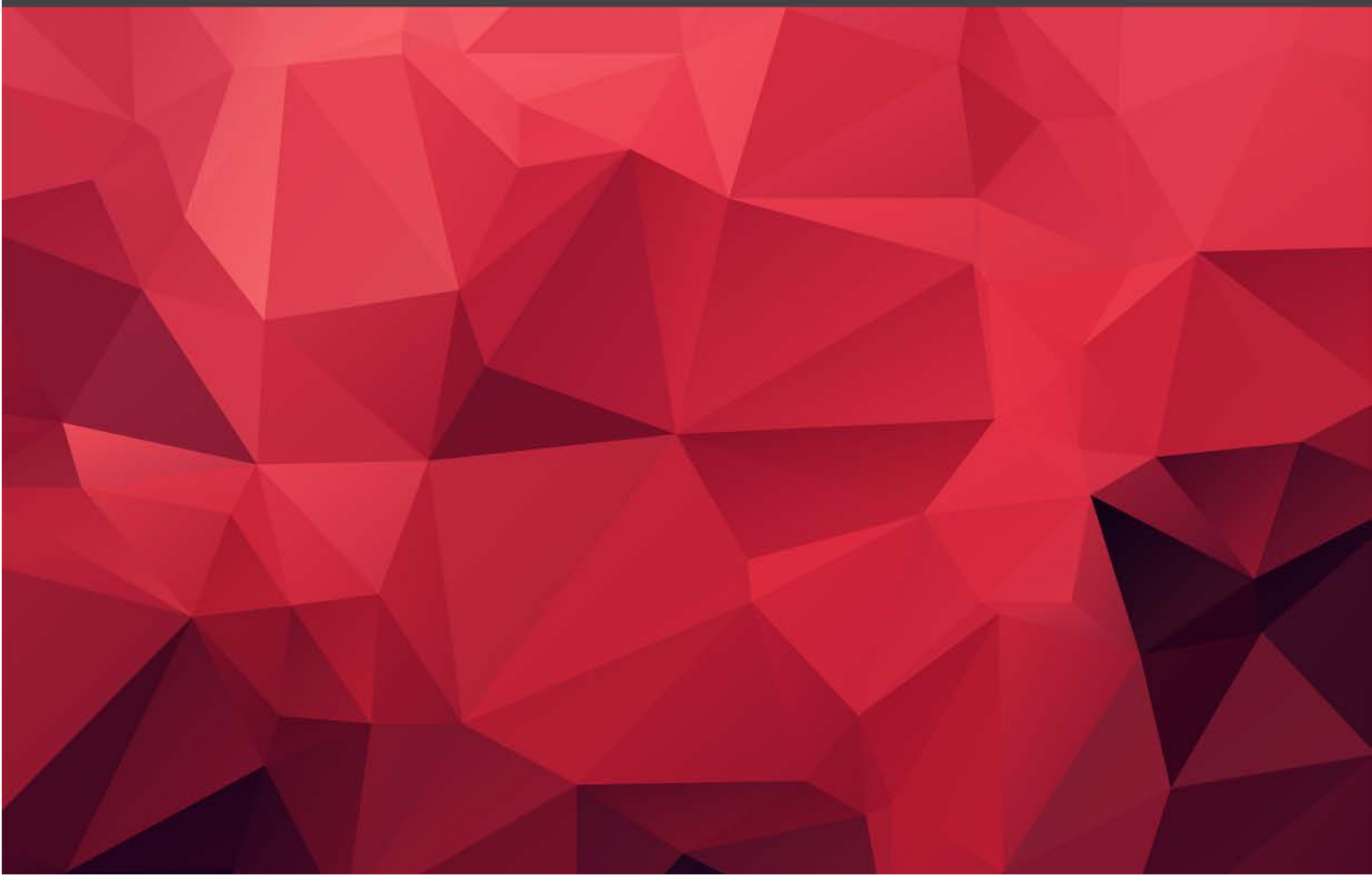

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Summary Report

Introduction

1 The world of technology has developed significantly in the last century and the rate of change is continuing at pace. Two of the more significant outcomes of this is our increased reliance on technology and the exponential increase in the volume of data we now hold and rely on.

2 Health Boards need to ensure they have reliable, secure, and accurate information systems and data on which they can rely to ensure patient safety. Over the last few years and particularly in the last 12 months we have seen increasing cyber-attacks affecting the IT systems of a number of companies and their ability to continue business as usual. This included a cyber-attack in 2017, which affected many organisations worldwide.

3 The 2017 cyber-attack affected a significant number of NHS bodies throughout the UK including here in Wales. In England, the cyber-attack caused a number of NHS bodies to suspend services directly affecting patients. They have acknowledged that their IT disaster recovery and their IT and operational/clinical business continuity did not operate as they anticipated. While this did not result in a loss of any data, there were delays in recovering systems and in continuing normal patient services while these systems were offline. While the impact on the NHS in Wales was not as severe as in England, the NHS in Wales should not be complacent but should learn from the experience of the NHS bodies in England.

4 Since 2012, we have completed Information Technology and Information Governance audits at Hywel Dda University Health Board (the Health Board) which have resulted in numerous recommendations. Previous follow-up reviews have identified that the Health Board has been slow in acting on these recommendations

5 As part of the Audit Plan for 2017, the Auditor General included local work to provide an updated position on recommendations from our IT reports undertaken between 2012 and 2015. We began in September 2017 and asked the following question: **Has the Health Board made sufficient progress in response to the recommendations made in the original reviews?**

6 In undertaking this progress update, we have:

- reviewed a range of documentation, including reports to the Board and its committees;
- reviewed system documentation and viewed live system information including testing some system controls;
- reviewed reports relating to work carried out by Internal Audit and NWIS which have impacted on or superseded our recommendations; and
- interviewed a number of Health Board staff to discuss progress, current issues and future challenges.

7 The following section provides a summary of our findings. Appendix 1 provides further details.

Our findings

8 Our overall conclusion is that historically, the Health Board has addressed recommendations slowly, but over the last 12 months, it has implemented the majority of recommendations, and work is underway to complete the remainder.

9 In summary, the status of progress against each of the previous recommendations is set out in Exhibit 1.

Exhibit 1: status of previous recommendations

Total number of recommendations	Implemented	In progress	Overdue	Superseded
26	16	9	-	1

Source: Wales Audit Office

10 We found that the Health Board has implemented 16 recommendations and made progress against nine of the recommendations, with one recommendation having been superseded.

- Information backup arrangements have substantially improved. Information Asset Owners and an Asset Register are now in place. Backup software is now in place, which has strengthened backup arrangements, but the Health Board still needs to develop backup policies for all systems. Currently generic policies exist based on national guidelines for the service type but information asset owners have not yet agreed these policies.
- The Health Board needs to further improve its disaster recovery and business continuity arrangements. Critically, it needs to test the arrangements to ensure they would operate as anticipated in the event of a catastrophic fail or significant successful cyber-attack.
- Data quality arrangements have improved but the Health Board needs to increase the pace of improvement particularly in engaging the information asset owners in the data quality assurance process.

Recommendations

11 We have identified two areas in relation to information backup arrangements that merit further recommendations. The Health Board needs to continue to make progress in addressing all outstanding recommendations. New and outstanding recommendations are set out in Exhibit 2.

Exhibit 2: recommendations

Previous recommendations that are still outstanding
Information Backup review
R3 Develop formal backup policies and plans for each system, which are agreed with asset owners and are based on the risk assessment.
Disaster Recovery and Business Continuity
R1 Develop a corporate approach to strengthen and support best practice in Disaster Recovery and Business Continuity (DR/BC), using a risk-based approach to prioritising resources to achieve it.
R3 Finalise the Disaster Recovery Strategy and develop an ICT assurance work plan, which includes a disaster recovery improvement programme. The programme should incorporate ICT disaster recovery training, the data centre project and the backup system project.
R4 Ensure in the Health Board's Business Continuity project the following are completed: • business continuity plans are developed for all departments (including ICT); and • define and implement the corporate process for monitoring, auditing and reporting progress for the regular testing of departmental business continuity plans.
R5 Develop and document an ICT Disaster Recovery plan for all systems for which the Health Board has disaster recovery responsibility.
R8 Design and implement a schedule of regular back-up media and disaster recovery testing to provide assurance that applications and data can be successfully restored in the time required after the loss of a system.
Data Quality
R3 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.
R5 Review the 'Strategy for Information Assurance within Hywel Dda Health Board' and ensure that it adequately covers all of the elements of a data quality policy, including: • data standards; use of patient information records; security and confidentiality; data and health records accreditation; quality of data used for performance reporting; data sourced from other providers; references to Clinical Coding and Clinical Coding Audit policies.
R8 Review the data quality processes at service level and ensure that good practice and testing mechanisms are shared and used across the whole Health Board. This may include: • routine data cleansing exercises to improve consistency between PAS and Radiology systems; and • establishment of weekly clinical coding supervisor sample testing and other good practice departmental checking mechanisms.

Previous recommendations that are still outstanding
New recommendations
Information backup
R11 Introduce continual monitoring of the Solarwinds software to identify network issues before they become critical.
R12 Implement a daily monitoring rota for the Asigra backup system to identify storage capacity issues before they become critical.

Source: Wales Audit Office

Appendix 1

Progress that the Health Board has made since our previous recommendations made between 2012 and 2015

Exhibit 3: Assessment of progress

Recommendation	Target date for implementation	Status	Summary of progress
Information Backup Review			
Planning for backup arrangements			
R1 Complete the asset register and identification/allocation of asset owners. The register should also identify whether there is a backup plan in place and link to the location of that backup plan. Backup plans should be based on a risk assessment of the individual system, agreed with asset owners and should meet the needs of the users.	March 16	Implemented	In our previous review, we found that while an information asset register existed it was incomplete and difficult to follow. It did not document whether there was a backup plan in place for each of the systems and it did not identify the location of each backup. Weaknesses in the information asset register were also identified in the Disaster Recovery/Business Continuity report of February 2012 and in our IM&T risk assessment in February 2014. Since our review, the Health Board made progress and now has a more comprehensive asset register in place called the service catalogue. This covers all systems and servers, is fully complete for all of the business critical systems (clinical and administration systems) and identifies whether these are national systems or local systems. The catalogue also records whether a backup is in place and details the type of backup and server location. The service catalogue identifies asset owners and there is an Information Asset Owners (IAO) group, which agrees changes to backup schedules and arrangements. The Health Board has an up to date backup monitoring system in place which records and automatically alerts IT staff via system email when

Recommendation	Target date for implementation	Status	Summary of progress
			problems occur with any of the backups. This system records and monitors all backups for servers and systems under the control of IT. (It does not monitor national systems or anything outside the control of IT). IT staff are also able to view the backup system log at any time. In addition to the service catalogue, the information governance team, with support from the IT team and department users, are conducting information asset audits to prepare for the introduction of the General Data Protection Regulations (GDPR) in May 2018. At the time of our audit, not all of the information asset audits had been completed but good progress had been made. These audits will ultimately ensure that the Health Board has a complete understanding of all its information assets. They will also identify any IT systems, which by definition will be information assets, not under the control of IT, should any exist.
R2 Undertake a risk assessment of all IT systems to allow the Health Board to identify a prioritised response to system failure, and senior management to identify whether current IT resources are sufficient to mitigate the risks to the IT infrastructure and network in the event of a catastrophic failure.	March 2016	Implemented	Our previous review identified that changes to IT backup schedules were not formally monitored or agreed with asset owners. Our review also identified that no overall risk assessment of all IT systems had been undertaken. The Health Board has still not undertaken a full risk assessment of all its systems due to the lack of resources. However, the Health Board does have an up to date ICT risk register which feeds into the corporate risk register recording the major ICT risks across the Health Board. With Information Asset Owners now in place for all the business critical systems, the IAO group now identifies any significant risks and feeds them into the ICT risk register. This would include identifying the need to increase the backup frequency or type of backup to meet service needs in the event of a catastrophic fail.

Recommendation		Target date for implementation	Status	Summary of progress
R3	Develop formal backup policies and plans for each system, which are agreed with asset owners and are based on the risk assessment put forward in R2 above.	March 2016	In progress	Our previous review identified that formal backup policies and plans for each system did not exist and asset owners were not in place. A formal backup policy is now in place and, while not all systems have specific plans in place, generic plans based on the technology type and system use have been developed for all systems and are monitored by backup monitoring software. The Health Board is in the process of developing specific plans for all major business critical systems under its control. These are being developed with the Information Asset Owners and IT team.
R4	Agree and formally authorise the backup agreement for the Myrddin national system.	March 2016	Implemented	Our previous review identified that the agreement between the Health Board and NWIS for the backup of the nationally controlled Myrddin system had not been formally agreed or authorised. A formal agreement between the Health Board and NWIS is now in place for the Myrddin national system.
Arrangements to deliver effective backups				
R5	Confirm that critical legacy clinical systems, such as Breast PACS, Cardiology PACS and DAWN Warfarin prescribing system are located within the secure virtual environment. As a minimum all systems should be backed up to a remote site at a time and frequency appropriate to the criticality of the system and its data.	April 2016	Implemented	In our previous review, we found critical legacy systems including Breast PACS, Cardiology PACS and DAWN Warfarin prescribing systems were not located within the secure virtual environment. The status and location of these systems has been reviewed with the following results: • DAWN Warfarin prescribing system has had its infrastructure refreshed and it is now located within the main data centres and is replicated between sites; • Cardiology PACS is located on a separate infrastructure but held within the main data centres; and • Breast PACS is in the process of being migrated to the main Fuji PACS environment but backup arrangements are in place while this is taking place. All systems are backed up and replicated between the main data centres. Backups are monitored.

Recommendation		Target date for implementation	Status	Summary of progress
R6	Develop a procedure to ensure that all changes to backup policies, plans and procedures are fully documented and approved by an appropriate manager.	September 2016	Implemented	Our previous review found that formal change control procedures did not exist to document changes to backup policies, plans and procedures. As referred to above, the IAO group identifies changes to backup plans and procedures. These will then be documented as service management activities in the annual Informatics Operational Plan. Formal backup policy changes will form part of the annual Informatics Operational Plan as necessary or update frequency dictates. Since these procedures are new we have not been able to see these operating but the arrangements are now in place.
R7	Implement monitoring procedures for live and backup server hardware and all associated software.	April 2016	Implemented but possible further benefits to be gained	Formal procedures for monitoring the live and backup server hardware were not in place during our Backup Review. The Solarwinds system, used in a number of Health Boards, is now being used to monitor network and both live and backup servers. It provides a visual dashboard display and daily reports on system/server health and backup performance. The effectiveness of this system would be further enhanced to enable the IT team to identify issues before they become system/server critical if display monitors showing the live dashboard were available to and monitored by staff on an ongoing basis, perhaps by the help desk team.
R8	Where possible, replace ageing hardware that is due to go out of support to ensure security of the systems and data. This was also recommended in our 2012 Disaster Recovery (DR) and Business Continuity (BC) report.	April 2016	Implemented	Both our Backup Review, and our Disaster Recovery and Business Continuity Review recommended that aging hardware that is due to go out of support should be replaced where possible. Most legacy systems in place during our reviews and within the control of the Health Board have now been replaced but with the technology landscape moving forward at pace this is an ongoing challenge for the Health Board. However aging hardware is being replaced as capital funding allows and this is demonstrated by the legacy hardware and software scheduled to be replaced on the 2017/18 ICT Operational Plan as follows: • Network hardware at Glangwili Hospital • E-Mail

Recommendation	Target date for implementation	Status	Summary of progress
			• VMWARE • Storage systems Although aging hardware and software is still being replaced, we have considered this recommendation implemented as the Health Board is replacing outdated hardware and systems as funding allows. We will continue to monitor this as part of our annual risk assessment to ensure the Health Board is not putting patient safety at risk by not replacing hardware and software that is out of date and no longer supported.
Performance monitoring for backups			
R9 Consider standardising the backup software used as this may prove more efficient and be more easily monitored. As a minimum: • all backup software and hardware should be up to date and monitored regularly; and • backups should tested on a regular basis. Backup testing, where test systems are regularly created from backup media, can be evidenced by recording each test system creation as a Disaster Recovery test.	April 2016	Implemented	Our Backup Review identified that there were a number of different backup software in use. This was largely due to legacy backup systems still being in place for some systems. Monitoring the variety of systems was inefficient as was maintaining the number of backup systems. Since our review, the Health Board has purchased the Asigra backup system, which is now used to backup the systems under the control of the Health Board (National systems are subject to national backup arrangements and not within the control of the Health Board). Initially, full implementation of the new backup system was delayed due to storage issues but this was rectified in March 2017 and the final legacy backup system has now been decommissioned. Asigra backup also monitors all backups and provides alerts of any backup fails or issues allowing the IT team to take appropriate remedial action. This system also allows full scheduling of backups to be recorded along with any changes to the scheduling, providing an audit trail for backups.

Recommendation		Target date for implementation	Status	Summary of progress
R10	Ensure that performance of backups, file size, issues encountered, time to resolve issues are recorded and reported formally to senior managers and appropriate committees. Collection of performance information can identify potential data storage issues, hardware:	April 2016	Implemented but further benefits to be gained	In our previous review, we found that the performance of backups was not consistently monitored or reported, and there was a risk that potential hardware, software and data storage issues would not be identified with sufficient time for the Health Board to take remedial action. As detailed above, the new Asigra backup system provides reports and active monitoring of the backups. However, this system is not actively monitored on a daily basis and, while actual faults will be emailed to staff by the system, this may still not provide sufficient time for the Health Board to take action on issues such as storage capacity. To mitigate this, the Health Board should timetable/schedule staff to review the Asigra system reports on a daily basis with a view to identifying arising problems before actual failure occurs.
Disaster Recovery & Business Continuity				
R1	Develop a corporate approach to strengthen and support best practice in Disaster Recovery and Business Continuity (DR/BC), using a risk-based approach to prioritising resources to achieve it.	-	In progress	Our previous reviews identified that there was a lack of interaction between users and IT, and that no disaster recovery risk assessments had been completed resulting in a lack of clarity on system recovery times. Our original report was issued in 2012 and we reviewed progress in 2015 when no significant progress had been made. Since 2015, the IT team recognised that it was taking time to set up the IAO group and that action was needed in the interim. The IT team have therefore used national recovery point objective (RPO) /recovery time objective (RTO) guidelines based on the service categorisation to set up interim recovery points and times for each system. While this still lacks the interaction with users, it does provide more clarity on DR/BC and represents progress against the recommendation. The plan is that the IAO group will discuss and agree the RPO and RTO for all major business critical systems in the near future. Since the IAO group is still in the early stages of development and have only met a few times at the time of our audit, this is still work in progress and as such, we will review progress against this in future audits.

Recommendation		Target date for implementation	Status	Summary of progress
R2	Review the contracts and agreements with external suppliers of clinical systems to ensure that there is adequate definition of: • responsibilities of the supplier and recipient organisations; • service location, set-up and resilience features; • service availability and contacts; • Key Performance Indicators (KPIs) and reporting these; • back-up arrangements; and • disaster recovery and business continuity arrangements.	-	Implemented depending on undertaking from the Health Board	Our 2015 review of progress against this recommendation identified that contracts for all major business critical IT systems had been reviewed. However, at that time we were unable to confirm that all contracts had been reviewed. The IT team have confirmed that no further progress has been made against this recommendation due to the number of contracts in place and the significant resources it would take to carry out a formal review of all contracts. Contracts will be reviewed as they come due for renewal. We recognise the pressures on the IT teams limited resources, that the contracts associated with the business critical IT systems have been reviewed, and that the majority of these are under formal SLA or managed services. We consider this recommendation implemented providing the Health Board agree that as contracts come to an end and they are renewed or replaced, the new contracts have adequate definition of the points made in the original recommendation as follows: • responsibilities of the supplier and recipient organisations; • service location, set-up and resilience features; • service availability and contacts; • Key Performance Indicators (KPIs) and reporting these; • back-up arrangements; and • disaster recovery and business continuity arrangements.
R3	Finalise the Disaster Recovery Strategy and develop an ICT assurance work plan, which includes a disaster recovery improvement programme. The programme should incorporate ICT disaster recovery training, the data centre project and the backup system project.	-	In progress	Our 2015 review identified that while progress had been made against this recommendation and there was a disaster recovery strategy in place, it did not reflect the fact that there were still legacy systems that remained outside the main data centre. Additionally service schedules had still not been agreed with system owners, data owners had not been identified for all systems and a full DR test had not been carried out. Further progress has now been made and the majority of legacy systems now sit within the main data centres. All of the business critical systems are now within this environment and backed up or replicated across the main data sites. Information Asset Owners are identified for

Recommendation	Target date for implementation	Status	Summary of progress
			all the business critical systems and are in the process of being identified for all systems as part of the GDPR work stream. Despite the progress made, action is still needed to fully comply with this recommendation. The IAO group is still at the early stage of development and therefore have not yet discussed and agreed the disaster recovery points or times for each system – these are currently generic points and times based on national guidelines for the types of services. This needs to be progressed and agreed recovery points and times, with associated resources should be set for each of the Health Boards IT systems/services. Finally, a formal DR test has been planned for the last 2 years but has not yet taken place. This means the Health Board has no definitive confirmation that the DR plans in place will result in the Health Board being able to recover its systems and services in the stated timeframe or indeed recover them at all should a catastrophic fail or significant cyber-attack occur. Feedback from English health organisations significantly affected by the recent cyber-attack identified that in the majority of cases, while they were able to recover their data, they could not do so within anticipated timeframes. They also identified that other elements of the disaster recovery plans, such as manual workarounds used while systems were down, did not operate as planned. A full-scale DR test would identify such issues in a controlled environment and allow the Health Board to be better prepared in the event of future cyber-attack or system/network fails.

Recommendation		Target date for implementation	Status	Summary of progress
R4	Ensure in the Health Board's Business Continuity project the following are completed: • business continuity plans are developed for all departments (including ICT); and • define and implement the corporate process for monitoring, auditing and reporting progress for the regular testing of departmental business continuity plans.	-	In progress – linked to point 3 above	Business continuity and disaster recovery plans have been developed for all departments but not fully tested – see points against R3 above.
R5	Develop and document an ICT Disaster Recovery plan for all systems for which the Health Board has disaster recovery responsibility.	-	In progress	Our previous follow up review in 2015 identified that plans were in place for national systems, Myrddin and the Welsh Clinical Portal but not in place for other systems. Generic ICT DR plans have now been developed for all systems but these have not yet been discussed or agreed with Information Asset Owners (system owners). There are plans to agree formal DR plans for each system with Information Asset Owners once the IAO group is fully established and the GDPR work, which needs to be completed before May 2018, is complete.
R6	Assess the physical and environmental controls at the Glangwili and Withybush data centres and deliver any necessary improvements as part of the data centre project.	-	Superseded by NWIS review	Our 2015 follow up review identified that the access controls at the main data centres were adequate at that time but that the controls at server rooms outside the main data centres were unknown. During 2017, NWIS carried out a formal review of data centres across the Health Board. Actions to address the recommendations from this review have been incorporated into the 2017/18 Information Governance Workplan and are in the process of being completed. Assurance will be provided to NWIS on progress against their recommendations and therefore we will consider our recommendation implemented given the NWIS review supersedes our previous review.

Recommendation	Target date for implementation	Status	Summary of progress
R7 Further improve the ICT network infrastructure resilience: • review and update all local area network diagrams to ensure that they reflect the current network configuration; • based on risk assessment, develop a programme of routine replacement of equipment as it becomes obsolete or unreliable; • complete an audit to map the location of all systems' servers and any associated contingency arrangements; and • ensure that adequate backup arrangements are in place for all systems, including storage of backup tapes in an off-site fireproof safe.	-	Implemented	Our 2015 follow up review identified that the Health Board had implemented most of the actions required for this recommendation but that adequate backup arrangements were not in place across all systems and the network diagrams covered only the main data centre sites. Our review of backup arrangements covered above addresses the issues of backups not being in place for all systems. Network diagrams are now in place for all sites. An ICT network project is underway to address the current risk associated with the network at the Glangwili site with funding bids planned in future years for the other acute sites.
R8 Design and implement a schedule of regular back-up media and disaster recovery testing to provide assurance that applications and data can be successfully restored in the time required after the loss of a system.	-	In progress	Our 2015 follow up review identified that backup testing was in place for some systems but that for other business critical systems such as Mental Health, Data Warehouse, E-rostering etc. there was no evidence of DR testing. A full service catalogue (information asset register) is now in place and we have been informed that testing windows are being developed as part of the further development of the service catalogue. Additionally new backup software now monitors all backups and provides alerts where backup has been unsuccessful or where there were issues. This shows that progress has been made but that full testing of backups is not yet in place.

Recommendation		Target date for implementation	Status	Summary of progress
Data Quality				
R1	Review the contribution of all data quality supporting groups and their reporting mechanisms, and ensure that there is a complete escalation process to advise the Board of key issues and risks.	-	Implemented	Our 2015 follow up identified that operational meetings were taking place for the systems under the control of IT. The Health Board now have Information Asset Owners in place for all business critical systems and are in the process of identifying Information Asset Owners for the remaining systems. The IAO group meets regularly and covers data quality as part of their remit. The group is monitored by the Information Governance Sub Committee and any issues or risks are escalated to the Executive team or Board via this sub committee.
R2	Initiate the Data Quality Steering Group: Agree and authorise the Terms of Reference; assign business-wide departmental data quality champions and ensure this group is included within the reporting mechanism for supporting groups.	-	Implemented	As per R1 above, the data quality steering group has been replaced by the IAO group, which has data quality as part of its remit. The Information Asset Owners are the data quality champions for their departments.
R3	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.	-	In progress	Our 2015 follow up review identified that a data quality report was in place for the Myrddin system but did not include other systems. This has not been further progressed to date but an initial report, which will include additional information, was planned for October 2017 with further development for the 2017-18 annual report. Given the slow progress against this recommendation, we will review the 2017/18 annual report and the data quality information contained within that report. The Health Board needs to increase the pace of its progress on data quality reporting.
R4	Clarify data quality roles and responsibilities across the Health Board and ensure, for all staff with responsibility for the accuracy of data, that: • responsibilities are defined within standardised job descriptions; and	-	Implemented	Our 2015 follow up identified this as implemented as this is now part of the all Wales job description which includes a specific section on data quality and is used by the NHS Wales wide.

Recommendation		Target date for implementation	Status	Summary of progress
	• these are communicated and understood.			
R5	Review the 'Strategy for Information Assurance within Hywel Dda Health Board' and ensure that it adequately covers all of the elements of a data quality policy, including: • data standards; • use of patient information records; • security and confidentiality; • data and health records accreditation; • quality of data used for performance reporting; • data sourced from other providers; and • references to Clinical Coding and Clinical Coding Audit policies.	-	In progress	Although the Health Board action plan of 2015 identified that a revised strategy had been developed, which was going through the information governance process, we were not provided with a copy of the draft strategy at that time. The Information Assurance Strategy is now being reviewed as part of the GDPR programme which includes a wider review of all information governance documents, such as policies, procedures and WASPI's, to ensure they are GDPR compliant. The plan was not finalised or approved at the time of our audit. We will follow up this recommendation as part of our 2018 IT risk assessment.
R6	Ensure that the migration to a single Myrddin system project includes a: • process mapping exercise to standardise procedures; and • a training and awareness programme for all data input staff.	-	Implemented	Our 2015 follow up identified that all, but Mental Health and Sexual Health services had been migrated into a single Myrddin system. The Health Board have made the decision, because of the sensitive nature of the data, to retain a separate Myrddin system for Sexual Health and we accept this decision. Mental Health was initially scheduled to be migrated into the main Myrddin system in April 2015. However, the Health Board and NWIS identified, while working through the logistics of the migration with NWIS, that this would be difficult. The Health Board are now waiting for this to be progressed by NWIS and it is therefore largely outside their control. Given this is within the remit of NWIS rather than the Health Board; we have considered this action implemented from the Health Boards perspective.

Recommendation		Target date for implementation	Status	Summary of progress
R7	Ensure that sufficient staffing resources are allocated to all clinical coding teams, and review the structure and educational requirements to maintain equality across the counties.	-	Implemented	Our 2015 review identified that action on this recommendation was complete. Since that review, further guidance has been provided by NWIS regarding the required number of coders and the Health Board has identified that it is complying with this, more up to date, guidance. Our 2018 planned all-Wales follow-up of clinical coding will review coding arrangements in more detail.
R8	Review the data quality processes at service level and ensure that good practice and testing mechanisms are shared and used across the whole Health Board. This may include: • routine data cleansing exercises to improve consistency between PAS and Radiology systems; and • establishment of weekly clinical coding supervisor sample testing and other good practice departmental checking mechanisms.	-	In progress	Our 2015 follow up identified that progress had been made, but that the progress did not fully address the audit recommendation particularly in relation to the reporting of the accuracy of clinical coding. The Health Board now has Information Asset Owners in place and as part of the IAO group; standardised approaches to data quality in respect of GP updates, patient deaths, duplicate records, etc. are being developed. This has not yet happened. Clinical coding audit process has been developed and implemented, but difficulties have been encountered in conducting the audits due to significant work pressures and changes to national targets. While we recognise that progress has been made in this area we consider that the recommendation has still not been fully met. We acknowledge that not all the barriers to this are within the Health Boards control such as the changes to national targets. We will continue to monitor progress against this recommendation, in particular the input and impact of the IAO group to this process.

Appendix 2

The Health Board's management response to new recommendations relating to information backup

Exhibit 4: management response

Ref	Recommendation	Intended outcome/benefit	High priority (yes/no)	Accepted (yes/no)	Management response	Completion date	Responsible officer
R11	Introduce continual monitoring of the Solarwinds software to identify network issues before they become critical.	To identify emerging system and network issues before they become critical.	Yes	Yes	The Health Board is in the process of introducing enhanced monitoring tools within Solarwinds to ensure that alerts can be sent to the Head of ICT and the Infrastructure Manager to ensure that network issues are monitored within and out of hours.	June 2018	Assistant Director of Informatics Head of ICT
R12	Implement a daily monitoring rota for the Asigra backup system to identify storage capacity issues before they become critical.	To identify backup storage, which is nearing capacity before the storage capacity, is exhausted and the situation becomes critical.	Yes	Yes	The newly implemented storage infrastructure has an improved monitoring and an embedded analytical tool, which allows ease of monitoring.	June 2018	Assistant Director of Informatics Head of ICT

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