Meeting Date	**23 February 2023**	**Agenda Item**	
Report Title	**Mortality Review Plan**		
Report Author	Dr Raj Krishnan, Deputy Medical Director		
Report Sponsor	Dr Richard Evans, Executive Medical Director		
Presented by	Dr Raj Krishnan, Deputy Medical Director		
Freedom of Information	Open		
Purpose of the Report	The paper explains how data on mortality are captured and reviewed by the Health Board and proposed a new process for reviewing and learning from deaths, the mortality review process, and the development of a mortality reduction programme.		
Key Issues	Mortality has been identified as a key performance indicator for quality by the Health Board. The paper outlines the metrics for the indicator, the governance structure and the approach to reducing mortality in the health board.		

Specific Action Required ***(please choose one only)***	**Information**	**Discussion**	**Assurance**	**Approval**
	☐	☐	☒	☐

Recommendations

Members are asked to **note** the report and **agree** the following action points and outcomes:

a) Creating a mortality dashboard for Medical examiner review, crude and condition speciality mortality ratio - Digital/BIS team. Medical examiner and crude mortality dash board to be created by 1st February 2023 and Condition specific mortality dashboard by 1st April 2023.

b) The data to be reviewed monthly and triangulated to identify outliers and theme – Mortality Review Panel from 1st February 2023.

c) Outliers will be identified by the Mortality review panel and brought to attention of the clinical team, the Clinical

	Outcomes and Effectiveness and the Patient Safety group - Mortality Review panel from 1st February 2023. d) The clinical team will undertake a thematic analysis for outliers from the Medical Examiner reviews to develop a QI programme – Clinical Directors as determined by Service Group Medical Directors from 1st February 2023. e) The outcome from the QI process will be reported to the Clinical Outcomes and Effectiveness group and the Patient safety group – Clinical Directors/Service Group Medical Directors from 1st February 2023.

Mortality review programme

1. Introduction

Quality is the number one priority for the Health Board (HB), which aims to provide excellent clinical outcomes and improving the safety of patients by reducing avoidable harm; and to embed a culture where staff are empowered and encouraged to improve the quality of care that we provide. The Health Board (HB) strives to be a learning organisation. Mortality is a key quality indicator: understanding mortality rates and learning from deaths is recognised as an opportunity to improve care.

This paper discusses and explains the different ways in which mortality data are captured; describes the current processes for reviewing mortality; and outlines how the HB proposes to monitor and learn from deaths in the future.

2. Background

Mortality has been used to assess quality of care since the 19th century[1]. Mortality ratios and review came into importance after Francis's Mid-Staff enquiry in Feb 2013[2].

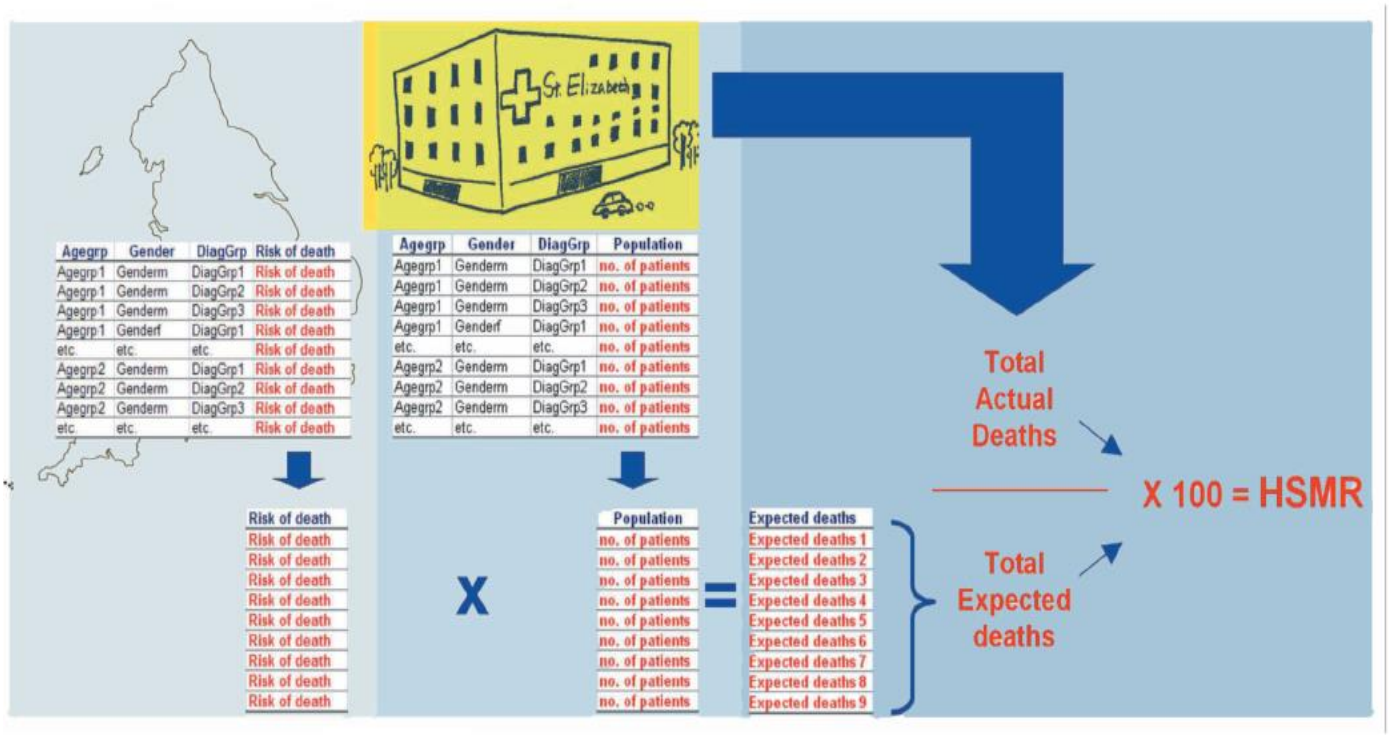
Over the years, mortality has been evaluated in different ways to see how it could help to make a difference to patient care. The COVID pandemic drew attention on how the mortality review process could help improve patient care[3].

Currently, healthcare organisations across the UK use various methods to monitor mortality numbers. Standardised mortality ratio (SMR) is commonly used across various organisations.

Standardised mortality ratio (SMR) is *the ratio of the number of deaths in hospital within a given time period, to the number that might be expected if the hospital has the same death rates as some reference population (e.g. the hospitalised population of Wales).*

A graphic description of the SMR is as below;

Figure 1



SMR in the standard population is 100 = there is an exact match between the actual and expected deaths. So, if the SMR is 85%, then it has 15% fewer deaths than expected; if it is 120 then it would mean that there was 20% more death than expected.

The 'excess deaths' when the SMR is 120% is 20% more than what was expected. The use of the term '**excess**' is technical and is often confused as deaths which were avoidable or unexpected, which are attributable to failings in the quality of care. However, none of these could be inferred from the ratio.

The below example (Table 1 and 2) will explain why the ratios must be interpreted with caution.

Table 1

	SMR	% catchment population deaths in hospital	% catchment population deaths in hospice	% catchment population deaths in care & residential homes
Health Board - A	**70**	**46.7**	**5.6**	**21.7**
Health Board – B	**120**	**65.9**	**3.9**	**9.5**
Wales	**100**	**58.4**	**5.0**	**15.6**

HB 'A" has low SMR, but if the data is reviewed closer than one could see that the residential home deaths were higher in that area.

Table 2

	SMR	% catchment population deaths in hospital	% catchment population deaths in hospice	% catchment population deaths in care & residential homes
Health Board – A	**70**	46.7	**5.6**	**21.7**
Health Board – B	**120**	65.9	**3.9**	**9.5**
Wales	**100**	58.4	**5.0**	**15.6**

A robust data capturing, and coding process must be in place to ensure all variables are accounted for. This could not be heavily relied upon in our health board (HB) due to the shortcomings in data capturing and coding process.

There are several versions of SMR, the most used are Risk Adjusted Mortality Index (RAMI) and Hospital Standard Mortality Rate (HSMR). Both are generated by commercial organisations, the former by **CHKS** and the latter by **Dr Foster.**

The Francis report in February 2013 identified high mortality rates at Mid-Staffordshire. Questions were raised about the mortality numbers in other NHS organisations, and ratios were used as a marker of quality of care and performance. This was further supported by the Keogh report which reviewed mortality ratios and placed 14 outlier organisations in special measures[4].

In the wake of interest in mortality ratios generated in NHS England, Welsh Government in 2014 asked Professor Stephen Palmer to review mortality ratios and its associated processes. Professor Palmer concluded that mortality ratios including RAMI were an unhelpful set of numbers and should not be used as indicators of care. The report concluded that HB's should be relying on clinical note review to identify avoidable deaths[5].

In May 2015, Darzi et al commented that standardised mortality ratios are not a validated tool to measure the quality of care in healthcare organisations, as a statistical association could not be established between the hospital wide standardised mortality ratio and proportion of avoidable deaths[6]. The paper concluded that healthcare organisations should be concentrating on SMR for specific conditions where the outcomes were well defined as there are proven treatments for specific conditions e.g., Myocardial infarction, Sepsis, Hip fracture etc.

3. Current Governance arrangements

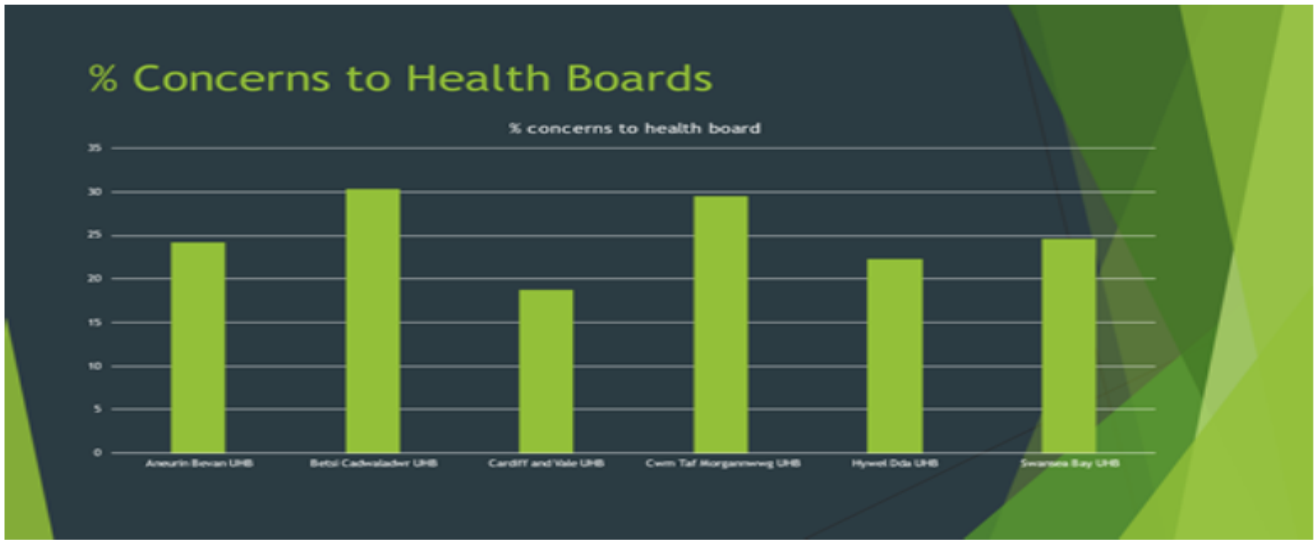
Mortality is monitored via multiple ways within the HB.

3.1 Mortality review panel and Medical Examiner service

The Medical Examiner (ME) service will be mandated from April 2023. In Wales, the ME is run centrally by the Shared Services partnership[7]. This helps to get an independent scrutiny of all the deaths that are not directly referred to the coroner.

The clinical team will identify the cause of the death and is expected to complete the **Medical Certificate of Cause of Death (MCCD).** The MCCD will not registered by the Registrar until the ME has reviewed the cause of death with the clinical team. The ME will then proceed to undertake a review of the notes and contact the bereaved family or representative to identify any concerns. If there are concerns identified, then the case is referred to the HB for a further review. The below chart (Figure 2) demonstrates the return undertaken by the ME over the last nine months for each HB in Wales.

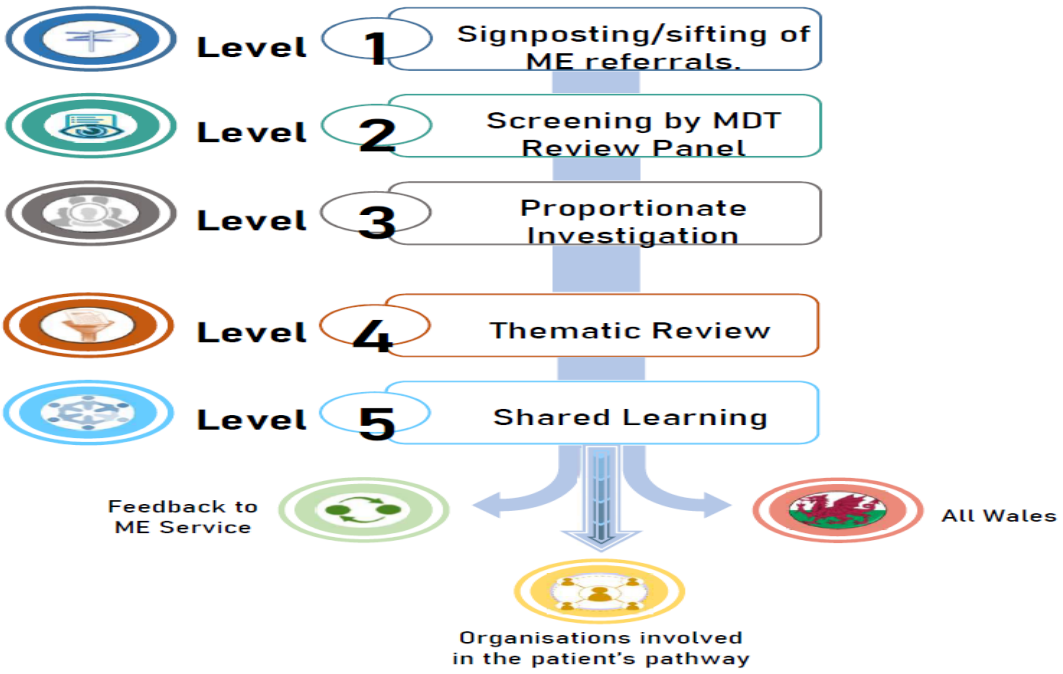
Figure 2 – Chart demonstrating return by the Medical Examiner for further review across Wales



The referral from the ME is reviewed by the Mortality review panel (MRP). The panel was established in September 2021 and is chaired by the Deputy Medical Director. The MRP reports to the Clinical Outcome and Effectiveness group (COEG) which reports on mortality to the Patient Safety group.

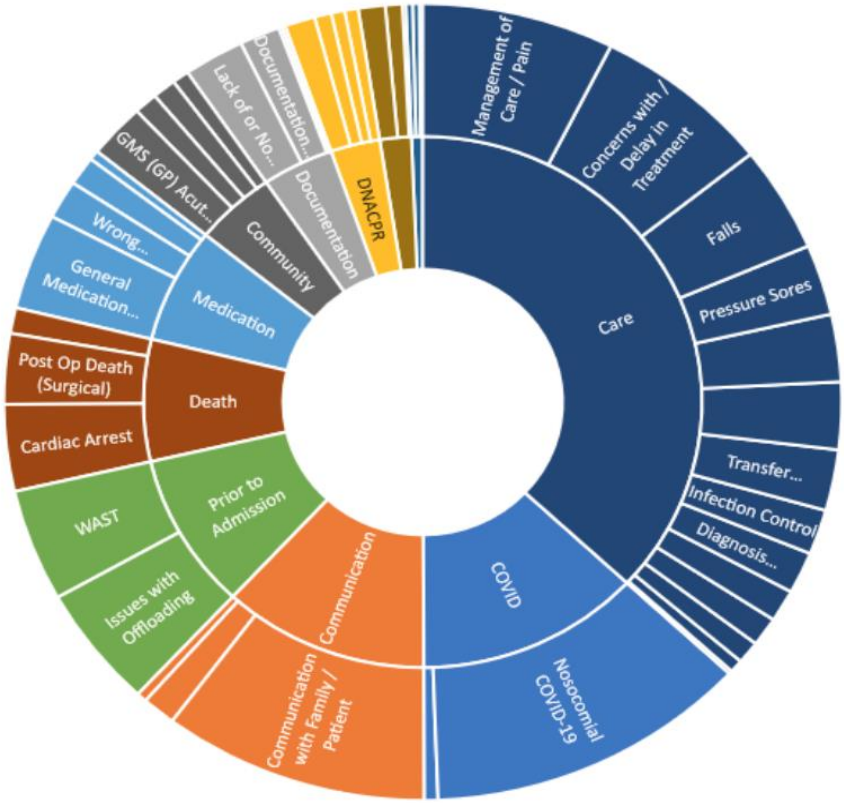
The MRP meets weekly and has representatives from all sites and different professional backgrounds. The meeting is well attended and sifts through the reviews that are sent back by the ME and identifies the one which needs proportionate investigation (see picture representation below; Figure 3).

Figure 3



The group also generates themes from the Medical Examiner reviews to help with the Learning from Death process. The themes identified by the MRP since Sep 2021 (Figure 4).

Figure 4 - Sunburst chart of themes



The themes are presented at the monthly Clinical Outcomes and Effectiveness group (COEG).

The ME service for the HB will be fully implemented for secondary service by April 2023 and over the next year for primary care.

3.2 Crude mortality rate and Condition Specific Mortality ratio

At the HB, both Crude mortality rate (CMR) and Condition Specific mortality ratios (CSMR) are reviewed on a regular basis. Crude mortality calculates the number of deaths in a given period divided by the population exposed to risk of death in that period. The condition specific mortality ratio will be undertaken for conditions where clinical guidelines and treatment pathway has been well defined.

CMR is calculated for all admissions across the HB on run charts for specific sites e.g. Emergency department. The CSMR is collated as part of the National audits and are reviewed by the individual clinical areas and escalated if there are outlier data sets.

3.3 Risk adjusted mortality index (RAMI) is monitored (Fig 5) through the CHKS website; however, this is not reliable due to the lack of coding (Figure 6 and 7) (see graphs below; blue is SBUHB and green are peers).

Figure 5

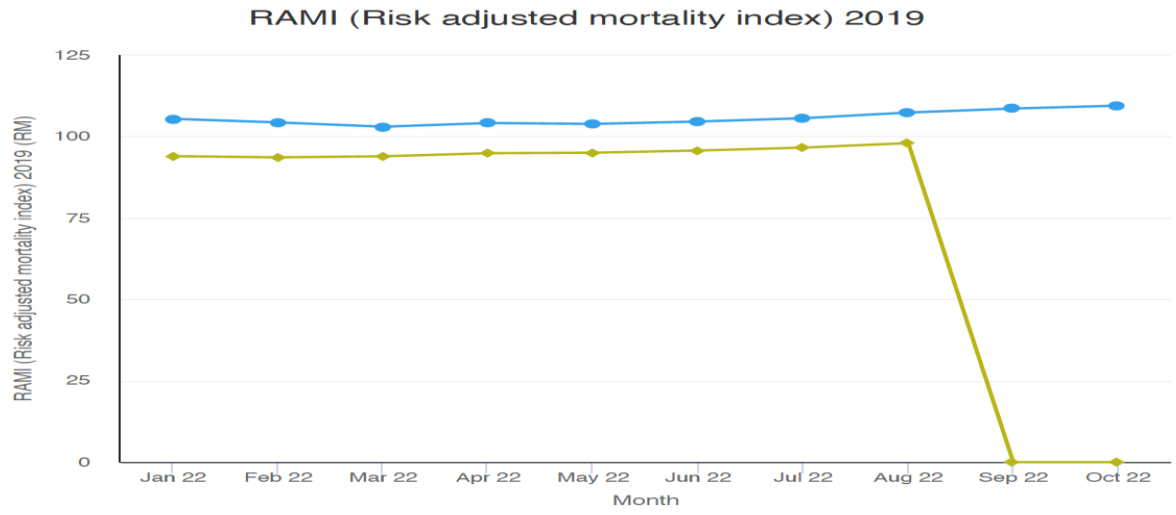


Figure 6

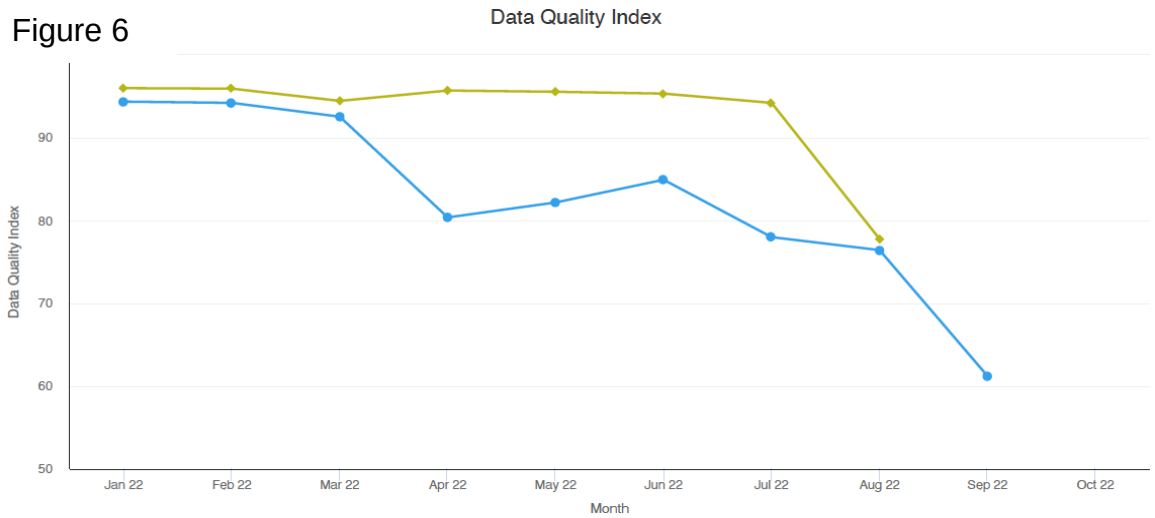
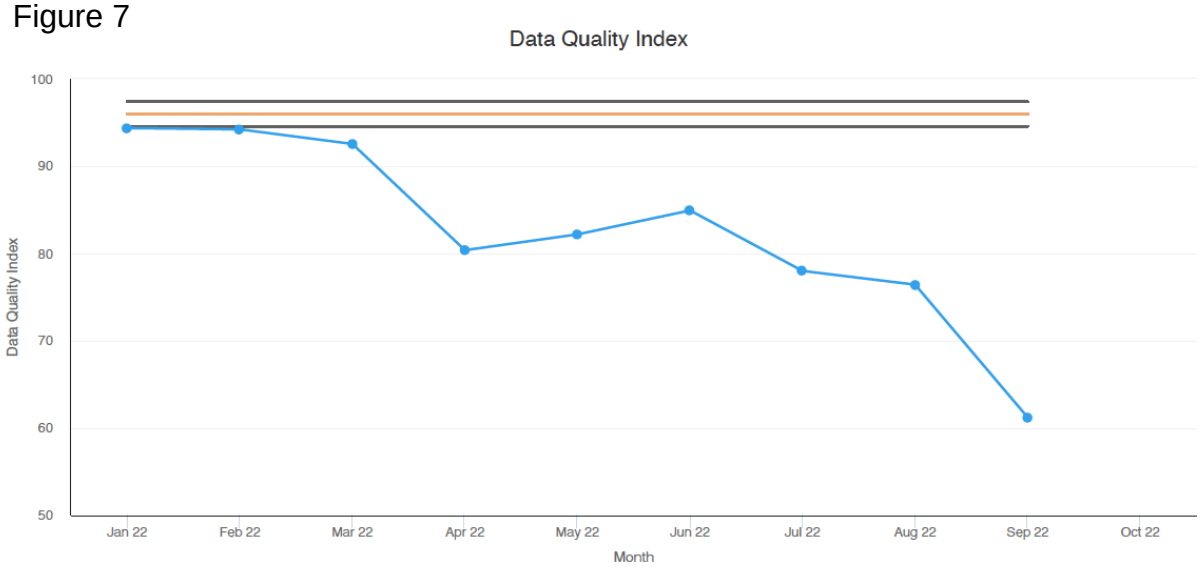


Figure 7



4. Limitations

Currently, mortality data is collected, but there is lack of triangulation of data sets, and hence improvement projects are not identified for themes and trends nor for outlier data.

The data from ME service is collated on spreadsheets which hinders the triangulation. The CMR is undertaken only for limited areas and these are visualized on run charts and hence unwarranted variation could not be identified. The CSMR is reported as part of National audits and there is often a delay up to 18 months before the report is published, and consequently there is a lack of buy-in from clinical teams as the data is historical.

The data is not reviewed in a cohesive manner. The themes from ME are reviewed at COEG, while both CMR and CSMR happen at the directorate or service group level.

RAMI from the CHKS website has shortfalls, including the lack of good data quality index, recommendation from Professor Palmer's review and lack of correlation with quality of care as identified by Darzi et al [5,6].

5. Executive Director Opinion/Key Issues to bring to the attention of the Board

5.1 Mortality reduction programme - Monitoring and Triangulation

This paper outlines a mortality reduction programme by creating mortality dashboards for the Medical Examiner review, the crude and condition specific mortality. The dashboards will enable the HB to monitor and triangulate mortality data regularly to identify variations. The dashboard will be reviewed on a monthly basis at the Mortality Review panel and any outlier status will be presented to the COEG meeting. The clinical team will be notified of the variation, so a 'deep dive' could be undertaken of the cases. The clinical team will have access to all the reviews undertaken by the ME to enable a detailed analysis. This will enable the team to identify themes and generate a Quality Improvement (QI) process to bring about the required change (Figure 8). The Clinical teams will report back to the COEG once the QI process has been completed. The identification of the variation and the QI process will be reported to the Patient Safety Group (PSG) by the COEG.

The Crude mortality rates will be extended to collate the following:

- Mortality rate for all admissions **across HB**
- Mortality rate by **age and gender**

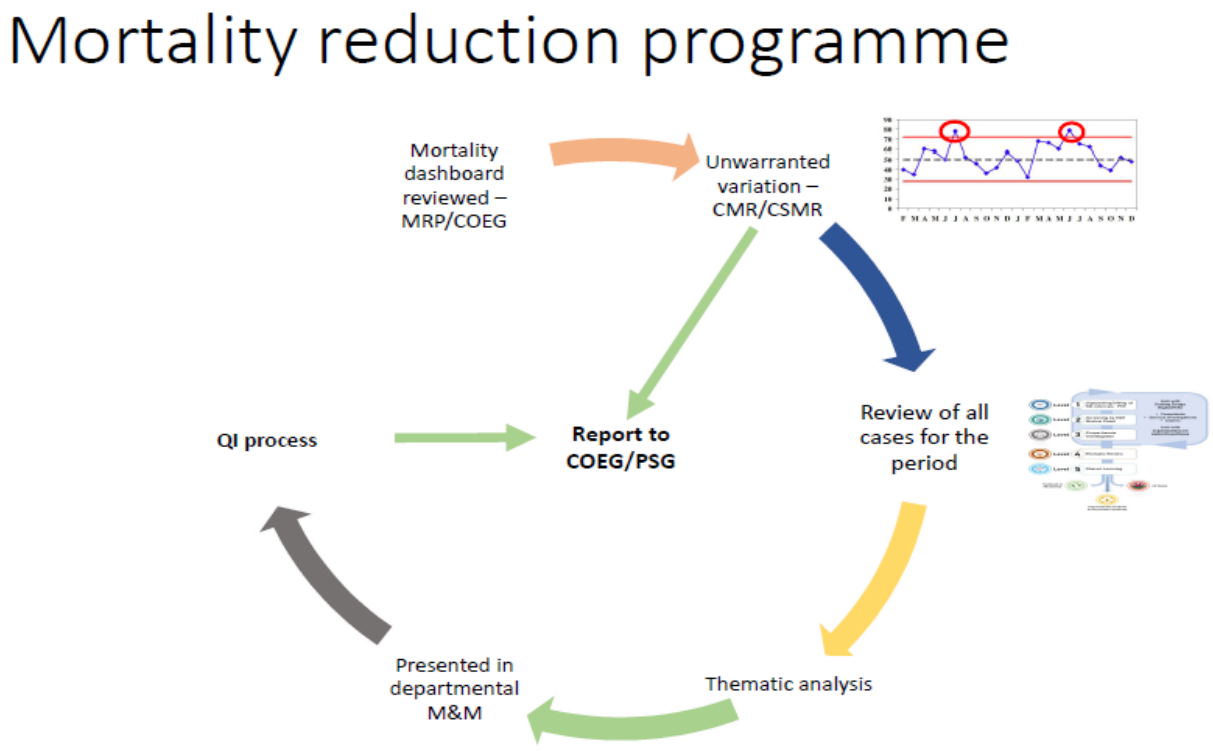
- Mortality rate for all admissions by **site**
- Mortality rate by **specialty ITU (Cardiac and General, Emergency Department and Neonatal unit)**
- Mortality rates by admission type **Elective/Non-Elective**
- Discharge mortality rate **within 30 days of discharge**
- Discharge mortality rate by specialty **within 30 days of discharge**

The following Condition Specific Mortality ratios will be monitored:

- Myocardial Infarction
- Stroke
- Pneumonia
- Sepsis
- Diabetes/Asthma/COPD
- Renal replacement therapy
- Cancer – Lung/Breast/Oesophageal cancer and others
- Cardiac – Heart failure, Percutaneous Coronary Interventions (Coronary Angioplasty)
- High risk major surgery (e.g. Hip fracture, Abdominal Aortic Aneurysm, Carotid endarterectomy, emergency laparotomy, Cardiac surgery etc.)
- Still births/Perinatal mortality rate/Infant Mortality rate
- Maternal mortality

Most of the condition specific mortality rate are reported nationally enabling the HB to compare outcome with its peers. The plan is to create live data base for these, so outcomes could be reviewed regularly rather than relying on annual reports.

Figure 8



The topics identified under crude and condition specific mortality ratio will be reviewed regularly by the MRP. Changes will be brought to the dashboard to ensure topics that are of local and national importance are monitored.

6. Conclusion

SBUHB has a well-established process to undertake the Medical Examiner reviews. The creation of dashboards for crude and condition specific mortality ratio will enable the HB to monitor its mortality across different clinical areas, triangulate the various data sources to identify variation. If variation is identified, then QI process could be implemented to bring about improvement.

7. Financial Implications

There are no financial implications identified for this plan. The programme will be utilising existing resources to implement this.

8. Recommendations

Members are asked to **note** the report and **agree** the following action points and outcomes:

a) Creating a mortality dashboard for Medical examiner review, crude and condition speciality mortality ratio.

b) The data to be reviewed regularly and triangulated to identify outliers and themes.

c) Outliers will be identified by the Mortality review panel and brought to attention of the clinical team, the Clinical Outcomes and Effectiveness and the Patient Safety group.

d) The clinical team will undertake a thematic analysis for outliers from the Medical Examiner reviews to develop a QI programme.

e) The outcome from the QI process will be reported to the Clinical Outcomes and Effectiveness group and the Patient safety group.

References:

1. Nightingale F. Hospital Statics and Hospital Plans. London: Emily Faithfull & Co; 1862.

2. The Mid Staffordshire NHS Foundation Trust Inquiry. Report of the Mid Staffordshire NHS Foundation Trust public inquiry (Chair: Robert Francis). www.midstaffspublicinquiry.com/report.

3. COVID-19 Data Review: Update on COVID-19–Related Mortality https://www.cdc.gov/coronavirus/2019-ncov/science/data-review/index.html

4. Keogh B. Review into the quality of care and treatment provided by 14 hospital trusts in England: overview report. www.nhs.uk/nhsengland/bruce-keogh-review/documents/outcomes/ keogh-review-final-report.pdf.

5. Written Statement - Publication of Professor Stephen Palmer's review of the use of risk adjusted mortality data in NHS Wales Welsh Government. (https://gov.wales/written-statement-publication-professor-stephen-palmers-review-use-risk-adjusted-mortality-data-nhs).

6. Hogan, Helen, Rebecca Zipfel, Jenny Neuberger, Andrew Hutchings, Ara Darzi, and Nick Black. "Avoidability of hospital deaths and association with hospital-wide mortality ratios: retrospective case record review and regression analysis." BMJ 351 (2015).

7. Medical Examiner Service - NHS Wales Shared Services Partnership

Governance and Assurance		
Link to Enabling Objectives ***(please choose)***	**Supporting better health and wellbeing by actively promoting and empowering people to live well in resilient communities**	
	Partnerships for Improving Health and Wellbeing	☒
	Co-Production and Health Literacy	☐
	Digitally Enabled Health and Wellbeing	☐
	Deliver better care through excellent health and care services achieving the outcomes that matter most to people	
	Best Value Outcomes and High Quality Care	☒
	Partnerships for Care	☐
	Excellent Staff	☐
	Digitally Enabled Care	☐
	Outstanding Research, Innovation, Education and Learning	☐
Health and Care Standards		
(please choose)	Staying Healthy	☐
	Safe Care	☒
	Effective Care	☒
	Dignified Care	☒
	Timely Care	☐
	Individual Care	☐
	Staff and Resources	☐

Quality, Safety and Patient Experience

The proposal will help the HB to achieve its quest to be a learning organisation and putting Quality at the forefront. Mortality is recognised as an opportunity to learn and improve care of subsequent patients and this paper outlines how the HB plans to achieve the same.

Financial Implications

Currently there are no financial implications of the proposal. This will have to be addressed when the Medical Examiner service is expanded across the HB.

Legal Implications (including equality and diversity assessment)

There are no legal implications identified.

Staffing Implications

There are no staffing implications.

Long Term Implications (including the impact of the Well-being of Future Generations (Wales) Act 2015)

Report History	None
Appendices	