

Assessment of compliance with the Code of Practice for Official Statistics

Patient Outcomes Statistics: Summary Hospital-level Mortality Indicator – Deaths associated with hospitalisation, England

*(produced by the Health and Social Care Information
Centre)*

© Crown Copyright 2015

The text in this document may be reproduced free of charge in any format or medium providing it is reproduced accurately and not used in a misleading context. The material must be acknowledged as Crown copyright and the title of the document specified.

Where we have identified any third party copyright material you will need to obtain permission from the copyright holders concerned.

For any other use of this material please write to Office of Public Sector Information, Information Policy Team, Kew, Richmond, Surrey TW9 4DU or email: licensing@opsi.gov.uk

About the UK Statistics Authority

The UK Statistics Authority is an independent body operating at arm's length from government as a non-ministerial department, directly accountable to Parliament. It was established on 1 April 2008 by the *Statistics and Registration Service Act 2007*.

The Authority's overall objective is to promote and safeguard the production and publication of official statistics that serve the public good. It is also required to promote and safeguard the quality and comprehensiveness of official statistics, and good practice in relation to official statistics.

The Statistics Authority has two main functions:

1. oversight of the Office for National Statistics (ONS) - the executive office of the Authority;
2. independent scrutiny (monitoring and assessment) of all official statistics produced in the UK.

Contact us

Tel: 0845 604 1857

Email: authority.enquiries@statistics.gsi.gov.uk

Website: www.statisticsauthority.gov.uk

UK Statistics Authority
1 Drummond Gate
London
SW1V 2QQ

Assessment of compliance with the Code of Practice for Official Statistics

Patient Outcomes Statistics: Summary Hospital-level Mortality Indicator – Deaths associated with hospitalisation, England

(produced by the Health and Social Care Information Centre)

NATIONAL STATISTICS STATUS

National Statistics status means that official statistics meet the highest standards of trustworthiness, quality and public value.



All official statistics should comply with all aspects of the *Code of Practice for Official Statistics*. They are awarded National Statistics status following an assessment by the Authority's regulatory arm. The Authority considers whether the statistics meet the highest standards of Code compliance, including the value they add to public decisions and debate.

It is a producer's responsibility to maintain compliance with the standards expected of National Statistics, and to improve its statistics on a continuous basis. If a producer becomes concerned about whether its statistics are still meeting the appropriate standards, it should discuss its concerns with the Authority promptly. National Statistics status can be removed at any point when the highest standards are not maintained, and reinstated when standards are restored.

Contents

Section 1: Summary of findings

Section 2: Subject of the assessment

Section 3: Assessment findings

Annex 1: Compliance with Standards for Statistical Reports

Annex 2: Summary of assessment process and users' views

Annex 3: Short description of NHS delivery services

1 Summary of findings

Introduction

- 1.1 This is one of a series of reports¹ prepared under the provisions of the *Statistics and Registration Service Act 2007*². The Act allows an appropriate authority³ to request an assessment of official statistics against the *Code of Practice for Official Statistics*⁴ in order for them to gain National Statistics status. This report is in response to such a request⁵ from the Secretary of State for Health in response to the Statistics Authority's *Monitoring Review: Official Statistics on Patient Outcomes in England*⁶. The report covers the set of statistics reported in *Summary Hospital-level Mortality Indicator – Deaths associated with hospitalisation, England*⁷, (*SHMI*) produced by the Health and Social Care Information Centre (HSCIC).
- 1.2 This report forms part of a group of assessments of patient outcomes statistics produced by HSCIC, the Care Quality Commission (CQC) and NHS England: the NHS Outcomes Framework and Patient Reported Outcome Measures, Patient Experiences and Patient Safety statistics.
- 1.3 This report was prepared by the Authority's Assessment team, and approved by the Regulation Committee on behalf of the Board of the Authority, based on the advice of the Director General for Regulation.

Decision concerning designation as National Statistics

- 1.4 The Authority judges that the statistics covered by this report do not fully comply with the Code of Practice for Official Statistics in the ways summarised in paragraphs 1.10. The Authority judges that the statistics published in *SHMI* can not be designated as National Statistics until the Authority has confirmed that appropriate actions have been taken by HSCIC to meet the Requirements listed in paragraph 1.10. HSCIC is expected to report its completed actions to the Authority by November 2015.
- 1.5 During the course of this assessment, HSCIC has confirmed that, following feedback from the Assessment team during the course of the assessment, a number of steps, which would otherwise have been formal recommendations, have already been taken. These steps have either been implemented in the statistics published in April 2015 or HSCIC told us that it plans to implement them to accompany the statistics published in July 2015. More detail is included in paragraphs 3.8, 3.10, and 3.17 of this report.

¹ <http://www.statisticsauthority.gov.uk/assessment/assessment-reports/index.html>

² http://www.opsi.gov.uk/Acts/acts2007/pdf/ukpga_20070018_en.pdf

³ Subsection 12(7) of the Act defines 'appropriate authority' as Ministers of the Crown, Scottish Ministers, Welsh Ministers, Northern Ireland departments or the National Statistician

⁴ <http://www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html>

⁵ <http://www.statisticsauthority.gov.uk/reports---correspondence/correspondence/letter-from-rt--hon--jeremy-hunt-mp-to-sir-andrew-dilnot-170314.pdf>

⁶ <http://www.statisticsauthority.gov.uk/assessment/monitoring/monitoring-reviews/monitoring-review-1-2014---official-statistics-on-patient-outcomes-in-england.pdf>

⁷ <http://www.hscic.gov.uk/catalogue/PUB16479/shmi-deat-hosp-eng-jul-13-jun-14-rep.pdf>

Summary of strengths and weaknesses

- 1.6 HSCIC uses large volumes of data and sophisticated regression modelling to produce the national and trust-level SHMI on a quarterly basis. HSCIC published these statistics for the first time in October 2011 and, working with other experts, has improved the methods to the point where NHS trusts now use SHMI widely to evaluate their patient safety initiatives and improve their clinical practice. Published evidence suggests that the use of mortality indicators alongside other patient outcome statistics is significantly improving patient safety. Don Berwick in his report for NHS England about patient safety⁸ stated: *‘Unless and until a better metric is developed, the NHS should use mortality indicators....as one of its ways to detect potentially severe performance defects worth investigating further’*

The Authority commends the work that HSCIC and others have accomplished to develop these significant statistics in a short period.

- 1.7 The methodology used to compile SHMI, around which there has been and continues to be debate in the healthcare community and in the media, may project an implicitly comforting message that hospital-related mortality in 95 per cent of hospitals is ‘as-expected’. The substantive issue of excess deaths due to hospital care is not one which SHMI is designed to address, which means that those interested in such statistics have to turn to alternative forms of analysis to answer their queries. To promote the particular benefits of SHMI analysis, HSCIC will need to carefully position these indicators within the array of patient safety measures and advocate strongly their use in conjunction with other patient safety indicators.
- 1.8 HSCIC has active working relationships with many of the more-expert users of these statistics, and could develop the statistics and enhance their public value by:
- Engaging insightfully with a wider range of users and potential users – such as users in patient representative organisations
 - Improving the presentation of SHMI – for example, to explain better the context in which HSCIC publishes trusts’ mortality statistics, and to provide more-appropriate information to help users (including some trusts) to interpret the statistics appropriately
 - Further improving the assurance of the quality of the administrative data used to derive the statistics

Detailed recommendations

- 1.9 The Assessment team identified areas where it felt that HSCIC should improve the production and presentation of SHMI. Those which are essential for HSCIC

⁸ Page 28 of the Berwick Report “A promise to learn – a commitment to act; Improving the safety of Patients in England, 2013
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/226703/Berwick_Report.pdf

to address in order to strengthen its compliance with the *Code* and to enable designation as National Statistics are listed – as Requirements – in paragraph 1.10, alongside a short summary of the key findings that led to each Requirement being made. Other recommended changes, which the Assessment team considers would improve the statistics and the service provided to users but which are not formally required for their designation as National Statistics, are listed – as Suggestions – in paragraph 1.11.

Requirements for designation as National Statistics

1.10 This section includes those improvements that HSCIC is required to make in respect of its Summary Hospital-level Mortality Indicator in order to fully comply with the *Code of Practice for Official Statistics*, and to enable designation as National Statistics.

Finding	Requirement	
HSCIC engages well with SHMI key stakeholders but less well with users in patient representative groups. HSCIC has not considered these users' needs in developing the statistics. HSCIC should:	1	<ul style="list-style-type: none"> a) Develop a thorough understanding of the use and potential use of SHMI by engaging with patient representative organisations b) Publish the information that it has gathered about the views of potential users in patient representative organisations and explain how it will take these views into account in developing the statistics (para 3.6).
HSCIC does not present sufficient information about its quality assurance arrangements. Also, many trusts do not use the mechanism provided to verify and sign off their SHMI. HSCIC should:	2	<ul style="list-style-type: none"> a) Outline the data assurance arrangements for SHMI, taking into consideration the Authority's <i>Administrative Data Quality Assurance Toolkit</i> b) Investigate the reasons why some trusts do not sign off their SHMI and remove any barriers to them doing so c) Communicate effectively with staff who sign off their trust's SHMI to ensure that they fully understand their role in the verification procedures (para 3.14).
SHMI methods have been assured through HSCIC's Indicator Assurance procedure. This should have triggered the	3	Complete the Indicator Assurance Process so that additional details on the interpretation, risks and usefulness of SHMI may be included and published in the National Library of Quality Assured Indicators (para 3.16).

publication by HSCIC of more information on the interpretation, risks and usefulness of SHMI; this has not yet taken place. HSCIC should:		
HSCIC provides a statistical narrative to accompany SHMI. However, the commentary is better suited to more-expert users and does not clearly explain the relevance of the statistics. Despite its advice that people should use SHMI in conjunction with other (patient outcome) information HSCIC has not presented SHMI with that more holistic view of patient outcomes. HSCIC should:	4	<p>Improve the commentary in <i>SHMI</i> so that it aids users' interpretation of the statistics by:</p> <ul style="list-style-type: none"> a) clarifying the important messages, providing plain language descriptions and narrative about any longer term trends, for example whether variance in trusts' SHMI compared with the national average has reduced over time and the degree to which regional patterns are emerging b) highlighting the types of measures that trusts have taken to bring down their hospital-related mortality c) providing further explanatory information, particularly about persistent outliers <p>As part of meeting this Requirement, HSCIC should consider the points detailed in annex 1 and annex 2 (para 3.23).</p>

Suggestions for extracting maximum value from the statistics

1.11 This paragraph includes some suggestions for improvement to HSCIC's SHMI in the interest of the public good. These are not formally required for designation, but the Assessment team considers that their implementation will improve public confidence in the production, management and dissemination of official statistics.

We suggest that HSCIC:

1	Work with users and publish case studies that demonstrate the potential applications of SHMI, for example through the application of VLAD charts. Additionally publish in <i>SHMI</i> or link to information about alerts triggered by VLAD charts compiled during the reference period (para 3.6).
2	Review the appropriateness of using the terms 'outliers' and 'repeat outliers' in <i>SHMI</i> and examine whether more exact but appropriately descriptive terms may be used (para 3.22).

3	Reiterate, where statistics are presented in <i>SHMI</i> about whether a trust records repeatedly high or low SHMI values, its advice to users not to use SHMI in isolation of other relevant information about the quality of care, and provide examples and links to other indicators, where available (para 3.22).
4	Provide further explanatory information about SHMI for trusts that have been and remain in special measures (para 3.24).
5	Work with DH, NHS England, and with other data provider bodies as relevant, to identify the operational and policy issues that affect SHMI and provide helpful explanatory information about wider findings alongside its own statistics (para 3.24).

2 Subject of the assessment

2.1 Summary Hospital-level Mortality Indicator (SHMI) statistics are produced by the Health and Social Care Information Centre (HSCIC), an executive non-departmental public body sponsored by the Department of Health (DH) that acts as the national provider of information, data and IT systems for commissioners, analysts and clinicians in health and social care in England.

Patient Outcomes Review and the Francis Inquiry

2.2 Following publication of the *Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry*⁹ (chaired by Robert Francis QC) in February 2013, the Authority conducted an independent review of patient outcome statistics in England to consider the extent to which the public could more readily use these statistics. In its report, *Monitoring Review: Official Statistics on Patient Outcomes in England (Patient Outcomes Review)* which was published on 7 February 2014, the Authority recommended that the patient outcomes statistics be assessed against the *Code of Practice*. The Secretary of State for Health requested the assessment of HSCICs official SHMI statistics against the *Code* in response to that recommendation.

2.3 In addition to recommending the assessment of seven sets of official patient outcomes statistics, most of which are covered by the group of assessments outlined in paragraph 1.2 of this report¹⁰, *Patient Outcomes Review* makes other recommendations pertinent to this group of patient outcomes assessments. The Authority:

- sees a vital need for HSCIC and NHS England to disseminate consistent patient outcome statistics from all publicly-funded healthcare providers (whether NHS or independent sector) and, in the interim, to state clearly whether the current statistics do so
- recommends that HSCIC and NHS England engage closely with expert users such as in third sector organisations with a view to improving the clarity and accessibility of current patient outcome statistics for less-expert users
- recommends that HSCIC, NHS England, and CQC further research and publish the views of a wide range of users about their needs in respect of: (a) ensuring that the presentation of relevant statistics is accessible, clear and at a level of detail that supports their further use; and (b) extending the range of patient outcome statistics to address currently unmet needs

2.4 Specifically in respect of Summary Hospital-level Mortality Indicators, *Patient Outcomes Review* recommends that HSCIC provide more-straightforward guidance about hospital mortality statistics directed towards less-expert users.

⁹ <http://www.midstaffspublicinquiry.com/report>

¹⁰ Decisions about the timing of assessment by the Statistics Authority of NHS Safety Thermometer: Patient Harms and Harm Free Care and Friends and Family Test are pending

Summary Hospital-level Mortality Indicators and the Francis Inquiry

- 2.5 Robert Francis's Inquiry published its first report in 2010 in which it recommended, among other things, that DH set up an independent working group to examine and report on the methods used to produce standardised hospital mortality statistics in England. DH set up an expert group¹¹ to address concerns about the different indicators in use, the lack of consistency and the lack of clarity about the way producers were calculating some of the statistics. The working group's report recommended how such mortality statistics should be collected, analysed and published, both to promote public confidence and understanding of the process, and to assist trusts to use such statistics as a prompt to examine particular areas of patient care. DH committed to implementing SHMI as the single mortality indicator across the NHS. This work led to the publication of SHMI by HSCIC as experimental statistics. Following a review by HSCIC's Head of Profession for Statistics, HSCIC removed the experimental label in July 2014 having determined that the structure, format and content of SHMI were now reasonably stable.
- 2.6 In the final report, published in February 2013, the Francis Inquiry, noting that SHMI were not recognised as national or official statistics, recommended (number 271) that

'...the Department of Health and the Health and Social Care Information Centre should work towards establishing such status for them or any successor hospital mortality figures, and other patient outcome statistics, including reports showing provider-level detail'.

Summary Hospital-level Mortality Indicators

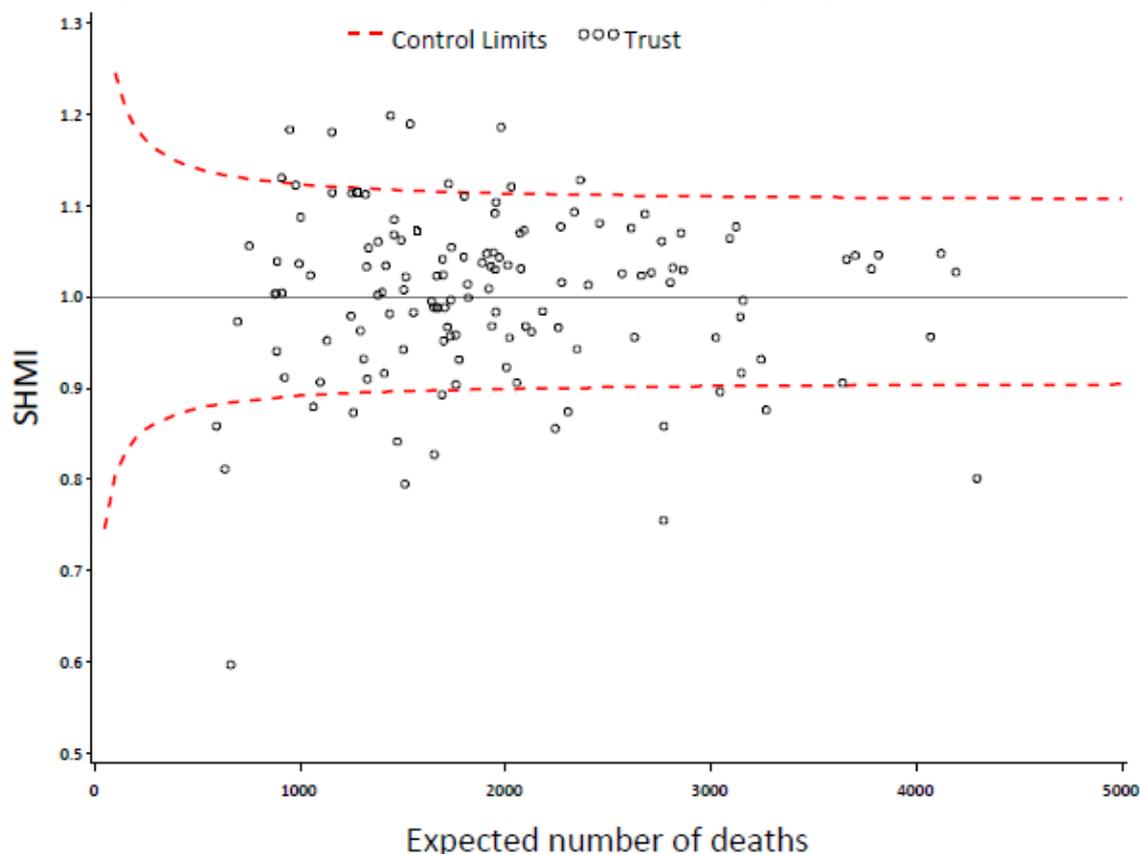
- 2.7 Since October 2011, HSCIC has produced *SHMI* on a quarterly basis, reporting on mortality at trust level across the NHS in England. HSCIC reports SHMI values on a rolling 12-month basis, about six months after the end of the period to which the statistics relate. SHMI is the ratio of the observed number of deaths to the expected number of deaths. The numerator for SHMI uses the deaths reported of patients admitted to non-specialist acute NHS trusts who either die while in hospital or within 30 days of discharge. HSCIC excludes specialist trusts, mental health trusts, and community trusts from SHMI. The denominator for SHMI is the number of deaths that HSCIC's models predict as being 'expected' for the period, in the context of the population served and the 'case-mix' of the hospital. The patient risk of mortality is determined using 140 different logistic regression models, and each model adjusts for the patient's diagnostic condition for which he or she is in hospital, age, sex, comorbidities and method of admission to hospital. SHMI are aggregate indicators, summarising hospital mortality across the wide and varied case-mix of patients treated by any given trust.
- 2.8 *SHMI* presents a funnel plot of SHMI values by expected number of deaths, showing performance of individual trusts relative to control limits. The funnel plot broadly illustrates the proportions of non-specialist NHS acute trusts¹² that

¹¹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/215965/dh_121353.pdf

¹² Short descriptions of the different NHS services delivery organisations are given in Annex 3

have SHMI values banded into one of three bands – ‘as expected’, ‘higher than expected’ and ‘lower than expected’. HSCIC determines statistical rules to decide which trusts fit into the three bands. Figure 1 presents an example of such a plot.

Figure 1: SHMI Funnel Plot of SHMI values by expected number of deaths



Source: HSCIC – Summary Hospital-level Mortality Indicator (SHMI) – Deaths associated with hospitalisation England October 2013 – September 2014: Quarterly Report¹³

2.9 The two dotted lines, which are respectively the upper and lower control limits (the boundaries within which the observed number of deaths within a trust are categorised ‘as expected’), create the funnel. Trusts whose SHMI values fall below the lower control limit are categorised as ‘lower than expected’. Trusts whose SHMI value appears above the upper control limit are categorised as ‘higher than expected’. Many possible reasons exist to explain why a trust’s SHMI value may not be as expected. DH has informed trusts¹⁴ that not taking action to review alerts¹⁵ arising from SHMI is inappropriate and would be a signal of poor Board governance. Trusts conduct further investigation in order to understand the underlying local context, drivers and factors affecting their trust’s SHMI value.

¹³ <http://www.hscic.gov.uk/catalogue/PUB17432/shmi-deat-hosp-eng-oct-13-sep-14-rep.pdf>

¹⁴ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/215965/dh_121353.pdf

¹⁵ Alerts are taken to mean when a trust has been made aware that its SHMI value is ‘higher than expected’

Data sources

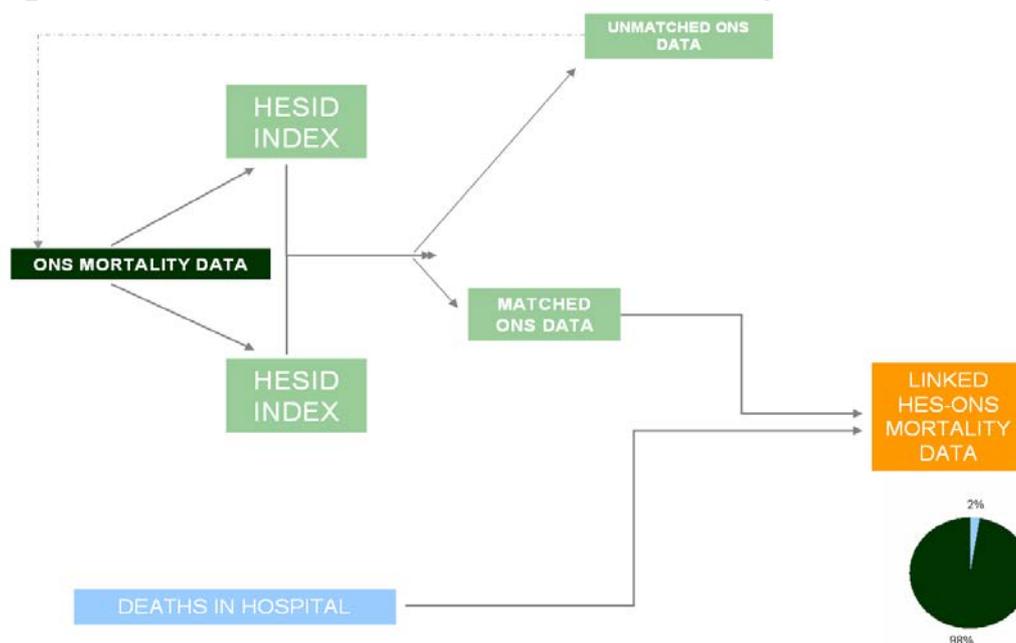
- 2.10 HSCIC produces *SHMI* based on administrative data that NHS trusts submit to HSCIC's Secondary Uses Service (SUS)¹⁶. HSCIC processes the SUS data to create Hospital Episode Statistics (HES) data. HSCIC processes multi-year Hospital Episode Statistics (HES) data from the Admitted Patient Care (APC) Commissioning Data Set (CDS)¹⁷. HSCIC uses patient activity data in HES to identify if a patient died in hospital. Deaths recorded in HES may be analysed by the main diagnosis for which the NHS was treating the patient, although analysts cannot use these data alone to determine the underlying cause of death. For example, a patient admitted for a hernia operation (with a primary diagnosis of hernia) may die from an unrelated heart attack. HES data are also limited in that they do not capture deaths happening outside hospital. Linking HES with the Office for National Statistics (ONS) deaths data addresses these issues
- 2.11 HSCIC combines HES data with death records held by the ONS to create a linked 'HES to ONS' dataset¹⁸. HSCIC links ONS's mortality data to HES by matching person identifiable data in the ONS mortality dataset with patient identifiers in HES (the HESID index). The linkage process results in assigning a unique HES patient identifier (HESID) to the ONS death record. The HESID is present in all HES data sets (Accident & Emergency, Admitted Patient Care and Outpatients), enabling patients to be tracked in a confidential way. Only ONS records that can successfully match to a patient in HES are included in the linked dataset. HSCIC rejects the ONS records that do not match, although in every subsequent month there is an opportunity to match with the latest available death registrations from ONS. For *SHMI*, HSCIC calculates the risk of mortality based on the condition for which the NHS admitted the patient to hospital. The expected number of mortalities is determined by deriving the risk of mortality at the patient level and then summarising to trust level for the defined period. Figure 2 presents a process diagram of how the administrative data on observable deaths are collected. Note that there are two boxes for HESID Index in the diagram because HSCIC uses HESIDs from two separate tables in matching the HES data to the ONS data. Additionally, the pie chart represents that in the linked dataset, 2 per cent of the death records are from the HES dataset and 98 per cent of the death records are from the ONS dataset.

¹⁶ <http://www.hscic.gov.uk/sus>

¹⁷ <http://www.hscic.gov.uk/catalogue/PUB12566>

¹⁸ http://www.hscic.gov.uk/media/11668/HES-ONS-Mortality-Data-Guide/pdf/guide_to_linked_ONS_HES_mortality_data_V4_040613.pdf

Figure 2: HES-ONS Linked dataset data collection process



Source: HSCIC - HOSPITAL EPISODE STATISTICS: A guide to linked ONS-HES mortality data

Users and uses of SHMI

2.12 SHMI and the data that underpin them have a range of current uses and potential applications including:

- By NHS trust clinicians, analysts and managers to assess whether their patient safety initiatives are effective, that they are optimising their clinical outcomes and that their systems of care work well. They also use them to brief their trust committees, from board-level to specialty-level. Trusts include SHMI in their routine reports for these committees and occasionally to illustrate comment in the trusts' newsletters
- By officials in DH and NHS England to provide high-level briefing to Ministers. HSCIC grants pre-release access for this purpose and emails the report and associated documents to those on this list at 9.30am the day before publication. Ministers receive a summary together with important facts from the report
- By NHS Choices¹⁹, which re-publishes SHMI as one of the key facts that patients can use when thinking about the questions they might ask their General Practitioner or consultant when considering choices about their treatment

¹⁹ NHS Choices: NHS Choices is the online 'front door' to the NHS. It is the largest health website in England and gives information to help patients and the carers make choices about patients' health treatment and provision. <http://www.nhs.uk/aboutNHSChoices/Pages/NHSChoicesintroduction.aspx>

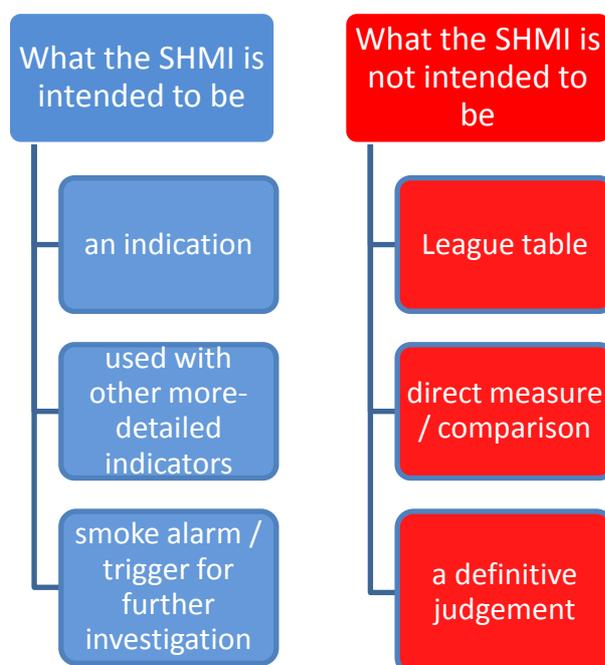
- By regulators (for example, the Care Quality Commission²⁰) which finds that SHMI help both in making decisions about which trusts to prioritise for inspection and in contributing to final assessments

‘They are not used for judging quality of care but to direct where we need to dig deeper: for example, by carrying out further analysis, requesting further information from an organisation or conducting an inspection. Further assessments would not just concentrate on mortality data but a range of other information such as surveys of patients and staff, infection rates and readmission rates’.

- By NHS commissioning organisations²¹, which use SHMI to investigate outcomes for trusts under their jurisdiction

2.13 HSCIC has set out what it sees as appropriate uses for the SHMI and those uses it thinks would be inappropriate, figure 3 illustrates this.

Figure 3: Appropriate and inappropriate uses for SHMI statistics



Source: HSCIC – presentation to GSS Northern Conference 2014: Estimating the risk of mortality in hospital patients 27 November 2014 (unpublished)

Other hospital-level mortality statistics

2.14 The Welsh Government publishes Mortality Statistics in Wales²² that include risk-adjusted mortality statistics for hospitals in Wales and ISD Scotland publishes Scottish Quarterly Hospital Standardised Mortality Ratios (HSMR) statistics²³. The authorities in Northern Ireland do not currently publish similar statistics for hospitals in Northern Ireland. Healthcare providers in England use

²⁰ <http://www.cqc.org.uk/>

²¹ http://www.phorcast.org.uk/page.php?page_id=259

²² <http://wales.gov.uk/docs/statistics/2013/130702-mortality-statistics-in-wales-en.pdf>

²³ <http://www.isdscotland.org/Health-Topics/Quality-Indicators/HSMR/>

a range of mortality indicators developed over time to suit particular needs. These include SHMI, Dr Foster's Hospital Standardised Mortality Ratios (HSMR) and CHKS's²⁴ Risk-Adjusted Mortality Index (RAMI). Comparing SHMI with HSMR reveals that a strong but not perfect relationship exists between the two. The different indices can produce quite different results for the same trust. However, differences between the measures may help to refine the methods used as well as clinicians' understanding of what hospital mortality means and what to do about it.

- 2.15 Both SHMI and HSMR are widely used in the NHS in England to capture different aspects of mortality rates. SHMI considers patients in trusts and includes all deaths both in hospital and for 30 days after discharge. HSMR considers the most serious life-threatening conditions (which take into account about 80 per cent of hospital deaths) and only includes deaths that take place while in the care of the hospital. There are differences in the levels that the different metrics consider to be 'above-expected' or 'below-expected' levels. HSMR uses 99.8 per cent control limits and so hospitals with HSMR scores outside these limits will be above or below expected. SHMI uses 95 per cent control limits. Additionally the factors that SHMI and HSMR adjust for vary between the two metrics.

The openness of SHMI data, the costs of producing SHMI, and data sharing

- 2.16 HSCIC publishes *SHMI* in html and PDF formats. SHMI data at trust level are available to download from the HSCIC Indicator Portal site²⁵ in Excel and in csv formats. Additionally, model output statistics are available in csv formats to support users wanting to apply their own data using the SHMI methods for further analysis or for investigative purposes. This equates to a level of three stars under the Five Star Scheme that forms part of the Open Standards Principles proposed in the *Open Data White Paper: Unleashing the Potential*²⁶ and adopted as UK government policy in November 2012²⁷. Five stars represents the highest star rating within the Scheme.
- 2.17 HSCIC told us that the cost of producing each quarterly *SHMI* is approximately £18,000 and that producing these statistics imposes little additional burden on the NHS.
- 2.18 HSCIC also makes the following data available on a restricted basis:
- Record-level data (identified or anonymised dependent on permissions) to for example, researchers, via an Extract Service. HSCIC's Data Access Request Service²⁸ manages this access and data is only uploaded in response to a specific request

²⁴ <http://www.chks.co.uk/>

²⁵ <http://indicators.ic.nhs.uk/webview/>

²⁶ http://data.gov.uk/sites/default/files/Open_data_White_Paper.pdf

²⁷ <https://www.gov.uk/government/publications/open-standards-principles/open-standards-principles>

²⁸ <http://www.hscic.gov.uk/dars>

- HSCIC also shares SHMI data with organisations outside of the NHS where it releases data and binds each organisation to a tightly governed agreement.

3 Assessment findings

Meeting User Needs and User Engagement

- 3.1 Following the reorganisation of the NHS²⁹ in England in 2012, HSCIC assumed a wider range of responsibilities for collecting, analysing, and presenting national health and social care data. It ran a consultation on its publication strategy³⁰ during September and October 2014. With this strategy, HSCIC is seeking to align with its stakeholders' priorities and to better meet the public's need for information on health and care. It published a response³¹ to the consultation in December 2014 and identified several actions, including: establishing a Publications Advisory Board; developing a process of internal and external peer review to improve statistical commentary and content; and seeking to improve the coherence and presentation of health and care statistics across organisations in England, as well as pan-UK comparisons. The Authority welcomes the actions planned by HSCIC to improve its understanding of the wider user needs for health and care statistics and encourages it to work with other health statistics producers, to deliver these actions in a timely and effective way.
- 3.2 DH, in setting up the independent working group to establish what is known now as SHMI, also created a technical working group. After DH asked HSCIC to develop SHMI, the latter took over chairmanship of the technical working group³² (TWG) and this continues today. The group meets two or three times a year and acts as expert peer reviewers of SHMI. Members of the TWG include representatives from, among others, DH, CQC, HSCIC, Professional Association of Clinical Coders, Public Health England, Dr Foster Intelligence and Dr Foster Unit at Imperial College London, and from research bodies with a specific interest in health and social care. The statistics team has effective working relationships with these principal users of its statistics. The statistics team captures stakeholders' and users' comments and suggestions in a SHMI Methodology Development Log³³ and selects some of these suggestions for discussion at TWG meetings. HSCIC provides a link to the proceedings of the TWG on the SHMI landing page of its website. The TWG has helped to establish SHMI quickly after DH commissioned the statistics and promoted the widespread application of SHMI, which can be seen today.
- 3.3 The statistics team includes in *SHMI* and related documents, some information about the uses of SHMI. Such information is more about the purposes of the statistics than about the types of decisions the statistics inform or the benefits realised from their use. The Assessment team noted that the contents of the SHMI Methodology Development Log and the published proceedings of the TWG demonstrate a good understanding by HSCIC of the needs of the users represented on the TWG. NHS England requires trusts to report their SHMI

²⁹ <http://www.nhs.uk/NHSEngland/thenhs/about/Pages/nhsstructure.aspx>

³⁰ http://www.hscic.gov.uk/media/15767/Outcome-to-the-Consultation/pdf/HSCIC_Publication_Strategy_Consultation_Questionnaire_Outcome.pdf

³¹ http://www.hscic.gov.uk/media/15767/Outcome-to-the-Consultation/pdf/HSCIC_Publication_Strategy_Consultation_Questionnaire_Outcome.pdf

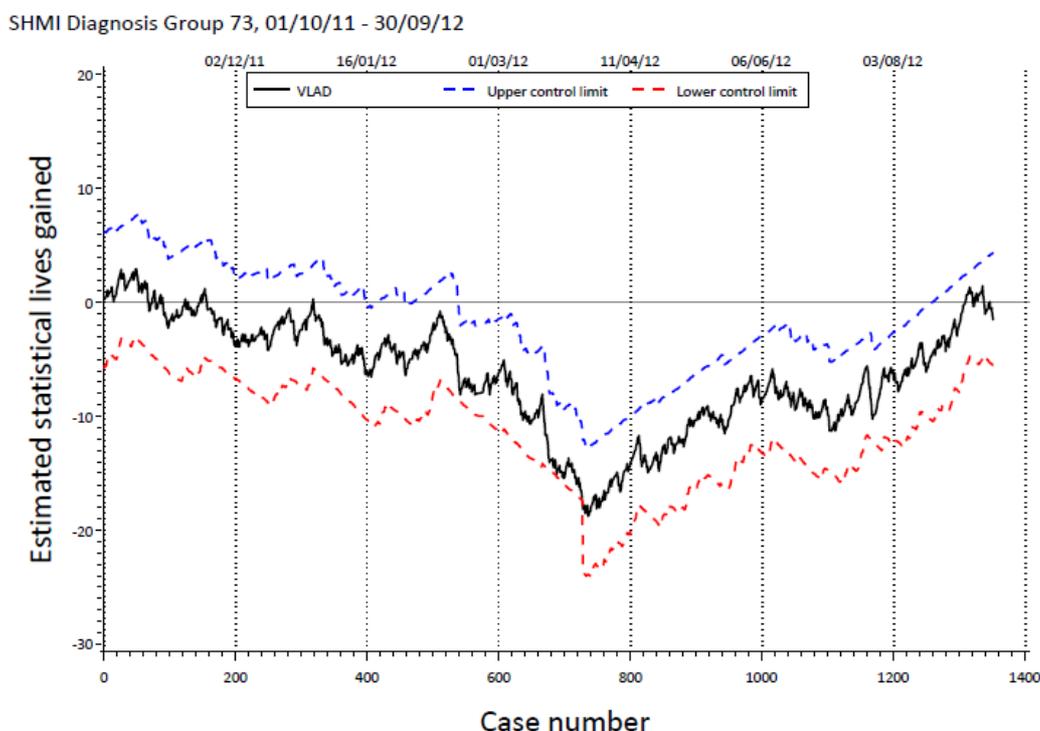
³² <http://www.hscic.gov.uk/shmi-tg>

³³ http://www.hscic.gov.uk/media/11160/SHMI-Methodology-Development-log/pdf/SHMI_Methodology_Development_Log.pdf

publicly in their Annual Trust Quality Accounts. NHS England also requires trusts to send their Annual Quality Accounts to local patient representative groups and to local authorities for comment; trusts must also publish comments from those bodies about the information in that year's Quality Accounts. There has been little engagement between the statistics team with bodies whose role is to represent patient's views to different healthcare decision-makers. Similarly, there has been little engagement between the statistics team and charitable bodies with a strong interest in end-of-life care. Trends towards the increased incidence of deaths outside of hospital and deaths occurring beyond a 30-day period after discharge are likely to influence SHMI statistics over time. As HSCIC has not yet explored these avenues of engagement there is no evidence that the needs of these potential users have influenced the development of these statistics. However, HSCIC told the Assessment team that it would value discussions with patient representative bodies and charities interested in SHMI statistics and has started to take steps to engage with such bodies.

- 3.4 The statistics team prepares Variable Life-Adjusted Display (VLAD) charts for approximately 10 of the 140 individual diagnosis groups that make up SHMI using statistics at lower levels of aggregation. These more granular statistics can highlight which specific clinical areas have the most impact on a trust's SHMI value. Essentially these charts show a running tally of the expected number of deaths minus the actual number of deaths.

Figure 4: VLAD Chart for SHMI Diagnosis Group 73: Pneumonia



Source: HSCIC – SHMI...and what next?³⁴

Note: dates have been added to the chart to illustrate the points in time when the cumulative numbers of cases were recorded

³⁴ http://www.healthcareconferencesuk.co.uk/news/newsfiles/karina-heather_178.pdf

3.5 Clinicians and analysts within trusts use VLAD charts to alert them to unusual cumulative differences between expected and observed deaths, resulting from particular conditions. This means that a trust can investigate and respond quickly; develop action plans and drive improvements when necessary. In the VLAD chart in figure 4 the middle (black) line is the VLAD, which is the cumulative difference between the observed and expected outcomes. The top (blue dotted) line is the upper control limit. If the VLAD crosses this control limit then this indicates a run of fewer deaths than expected and generates an alert. The bottom (red dotted) line is the lower control limit. If the VLAD crosses this control limit then this indicates a run of more deaths than expected and generates an alert. After an alert, the statistics team resets the control limits and the process restarts. VLAD analyses would appear to be relevant to those interested in particular conditions or to users interested in the performance of specific trusts. HSCIC does not publish information in *SHMI* about how this use of SHMI data helps trusts to improve patient safety. HSCIC told us that it provides a list of alerts triggered by these charts to CQC, but this information is not published either by HSCIC in *SHMI* or by CQC.

3.6 As part of the designation as National Statistics HSCIC should:

- a) develop a thorough understanding of the use and potential use of SHMI by engaging with patient representative organisations
- b) publish the information that it has gathered about the views of potential users in patient representative organisations and explain how it will take these views into account in developing the statistics³⁵

(Requirement 1).

In meeting this Requirement, we suggest that HSCIC work with users and publish case studies that demonstrate the potential applications of SHMI, for example through the application of VLAD charts. We further suggest that HSCIC publish in *SHMI* or link to information about alerts triggered by VLAD charts compiled during the reference period.

Appropriate use of the statistics

3.7 NHS England requires NHS trusts to publish core indicators in their Trust Quality Accounts³⁶; this includes their SHMI value and banding. When SHMI was first established, DH made it clear to trusts that it was inappropriate for trusts to compare their SHMI values in a 'league table'. The statistics team reiterates in *SHMI* that users should not compare mortality outcomes between trusts directly. Based on a small sample of only six sets of Trust Quality Accounts for 2013-14, the Assessment team identified some cases where trusts compared their SHMI values with other trusts. Additionally, again based

³⁵ In relation to Principle 1, Practice 1, 2 and 5 and Protocol 1, Practices 1 and 3 of the *Code of Practice*

³⁶ A Trust Quality Account is a report about the quality of services by an NHS healthcare provider. Each healthcare provider publishes the reports annually, including those in the independent sector, and these are available to the public. The Health Act 2009 requires all NHS providers of NHS services in England (except those who have fewer than 50 full-time employees and provide under £130,000 of NHS services) to produce a Trust Quality Account to provide information about the quality of those services.

on the same small sample of six trusts, the Assessment team found that some trusts publish both their SHMI and HSMR values and bandings. The Assessment team found examples where the HSMR and SHMI values for the same trust differ sufficiently so that one measure shows a score slightly higher than the national average (but within the expected range) and the other measure gives a result which is lower than expected for the same period. The trusts concerned provided little or no commentary offering plausible reasons why their mortality bandings might differ between the two indicators to help users interpret what the information might mean.

- 3.8 In response to the Assessment team's feedback during this assessment, HSCIC carried out a more comprehensive review of the presentation of SHMI statistics in Trust Quality Accounts for 136 non-specialist acute trusts in the reporting period 2013-14. HSCIC has published its findings on a new SHMI Research and Development page³⁷ on the SHMI web pages³⁸. The review found many examples of trusts presenting and explaining the SHMI statistics for their trust clearly and accurately. Many trusts also presented in their Quality Accounts useful information about the investigations that they have carried out using their SHMI information and actions taken to address any problems found. However, HSCIC also found several issues in the presentation of SHMI, which it sets out in the review report. For example, HSCIC found that in almost one in five of the Trust Quality Accounts reviewed, trusts either directly compared their SHMI with those for other trusts, or ranked trusts according to their SHMI. The report makes some detailed recommendations to overcome these issues in the future
- 3.9 HSCIC told us that concerns about the different types of indicators in use as mortality measures, in part, led to DH's initial review and the subsequent development of SHMI. The review concluded that the calculation of mortality indicators lacked consistency and clarity. HSCIC told the Authority in March 2013³⁹ that:
- 'it was never intended that the SHMI be the only aggregate indicator of mortality. There are others that continue to be used... both the SHMI and HSMR are based on the comparison of observed numbers of deaths with the number expected on the basis of a model which assigns a risk of death to each patient'.*
- 3.10 As part of this assessment, the Assessment team recommended to HSCIC that it should work with NHS England to advise trusts, when publishing SHMI in conjunction with other mortality indicators, that they should provide a suitable level of comparative analysis and commentary. Not to do so would risk confusing some users of these statistics. Following this assessment, and the findings of the review into the presentation of SHMI in Trust Quality Accounts, HSCIC recommended to NHS England that it change its Trust Quality Accounts documentation. NHS England has now updated its guidance, but some trusts have published their Quality Accounts for 2014-15 and will not be able to use

³⁷ <http://www.hscic.gov.uk/shmi-development>

³⁸ http://www.hscic.gov.uk/media/17959/Review-of-the-presentation-of-SHMI-statistics-in-the-2013-14-Quality-Accounts/pdf/Review_of_the_presentation_of_SHMI_statistics_in_the_2013-14_Quality_Accounts.pdf

³⁹ <http://www.statisticsauthority.gov.uk/reports---correspondence/correspondence/letter-from-andrew-dilnot-to-bernard-jenkin-mp-13032013.pdf>

the latest guidance until their 2015-16 accounts. The Authority commends HSCIC for the thoroughness and transparency of its review of these issues.

Data quality assurance

- 3.11 In light of the de-designation of police recorded crime statistics in January 2014 (in Assessment report 268⁴⁰), the Authority published⁴¹ a regulatory standard that confirms the quality assurance (QA) arrangements that are required for statistics compiled using administrative data to comply with the *Code of Practice*. The *Administrative Data Quality Assurance Toolkit*⁴² (QAAD) is the mechanism that the Authority is using to determine compliance in relation to four areas of practice:
- Operational context and administrative data collection
 - Communication with data supply partners
 - QA principles, standards and checks by data suppliers
 - Producers' QA investigations and documentation
- 3.12 The judgment by statistical producers about the suitability of the administrative data for use in producing official statistics should be pragmatic and proportionate. It should be made in the light of an evaluation of the likelihood of quality issues arising in the data that may affect the quality of the statistics. It should also reflect the nature of the public interest served by the statistics. Statistical producers should determine the types of assurance and documentation required to inform users about the quality assurance arrangements for administrative data.
- 3.13 The statistics team told us that it has been working with trusts on the quality assurance of SHMI. The statistics team invites Medical Directors, working with their analysts in individual trusts, to use a Previewer tool⁴³ to verify their trust's statistics produced by HSCIC against their trust management information. Signing off the provisional results indicates that their SHMI value is a reasonable reflection of trust's clinical activity. HSCIC told us that, for each quarterly *SHMI*, approximately 80 per cent of trusts access their provisional results for verification and approximately 50 per cent of them sign off the results. These levels of verification raise questions about HSCIC's approach to data validation, and the processes that it has put in place to assure itself of the quality of the data. Sir Bruce Keogh, the Medical Director of NHS England in his July 2013 Mortality Review⁴⁴ said that:

'Few of the hospitals had a good understanding of the reasons for their high mortality figures. This contributed to them having weak or

⁴⁰ <http://www.statisticsauthority.gov.uk/assessment/assessment-reports/assessment-report-268---statistics-on-crime-in-england-and-wales.pdf>

⁴¹ <http://www.statisticsauthority.gov.uk/assessment/monitoring/administrative-data-and-official-statistics/setting-the-standard.pdf>

⁴² <http://www.statisticsauthority.gov.uk/assessment/monitoring/administrative-data-and-official-statistics/quality-assurance-toolkit.pdf>

⁴³ Trust Medical Directors and analysts may access their Trust's own SHMI data through the Clinical Indicator Previewer at least 10 days prior to publication of SHMI. The information is provided for quality assurance purposes

⁴⁴ <http://www.nhs.uk/NHSEngland/bruce-keogh-review/Documents/outcomes/keogh-review-final-report.pdf>

*incomplete strategies for improving performance. The hospitals reviewed were often unaware of what information was reported nationally on their own organisations, and consistently challenged the validity of this (even if they provided the data themselves)*¹.

- 3.14 An important strength of SHMI is that HSCIC derives the statistics from independent administrative data that are amenable to extensive quality assurance and checks. It is vital to the future integrity of SHMI that HSCIC ensures that verification procedures are effective and that HSCIC gives different users appropriate and well-explained assurances about the quality and independence of the statistics. The Assessment team considers that there is scope for HSCIC to offer greater assurance around the verification of its trust-level SHMI. As part of the designation as National Statistics, HSCIC should
- a) outline the data assurance arrangements for SHMI, taking into consideration the Authority's *Administrative Data Quality Assurance Toolkit*⁴⁵
 - b) investigate the reasons why some trusts do not sign off their SHMI and remove any barriers to them doing so
 - c) communicate effectively with staff who sign off their trust's SHMI to ensure that they fully understand their role in the verification procedures⁴⁶
- (Requirement 2).

Supporting information about methods and quality

- 3.15 As SHMI are official patient outcome indicators, they are assured by HSCIC's Indicator Assurance Service (IAS). The Indicator Governance Board (IGB) approves the suitability of indicators following a critical assessment against set criteria by the Methodology Review Group (MRG). MRG and IGB comprise statistical, methodological and epidemiological experts from within HSCIC, including the Head of Profession for Statistics (HoP), and from the wider health and social care system – such as from CQC, National Institute for Health and Care Excellence (NICE), NHS Trust Development Agency, Health Education England and Monitor. MRG's role is to consider the method for proposed and existing indicators, checking the construction and meaningfulness of the indicators, the suitability of the data sources and the robustness of the data in relation to the purpose. The HoP for HSCIC is a member of MRG. HSCIC stores documentation reviewed by MRG and IGB within the IAS Repository. The IAS Repository can be accessed on request but users need to first register with HSCIC – HSCIC told us that it is reviewing this arrangement to provide more open access. The Authority commends HSCIC for its efforts to assure the methods used to produce these statistics.
- 3.16 The statistics team told the Assessment team that upon final sign-off by IGB as part of the HSCIC Indicator Assurance Process additional details on the interpretation, risks, and usefulness of SHMI will be made available on the

⁴⁵ <http://www.statisticsauthority.gov.uk/assessment/monitoring/administrative-data-and-official-statistics/quality-assurance-toolkit.pdf>

⁴⁶ In relation to Principle 4, Practice 3 of the *Code of Practice*

National Library of Quality Assured Indicators⁴⁷. As part of the process of inclusion in the National Library, a sponsor from DH or NHS England is required to take this forward. HSCIC is actively seeking an appropriate sponsor⁴⁸ from DH or NHS England for this purpose. As part of the designation as National Statistics, HSCIC should complete the Indicator Assurance Process so that additional details on the interpretation, risks and usefulness of SHMI may be included and published in the National Library of Quality Assured Indicators⁴⁹ (Requirement 3).

- 3.17 A user in an integrated community and acute trust told the Assessment team about concerns that the current SHMI methods do not compare trusts on a like-for-like basis. For example, some patients within an integrated trust may move from an acute setting to a community setting for rehabilitation care. In such cases, SHMI would include the time from admission at the acute site until 30 days following discharge from the community site. This may be considerably longer than a 30 day period post discharge from an acute setting alone, and thus introduces a distinct difference in counting between discrete acute and integrated acute and community settings. The statistics team told the Assessment team that it has no way, at present, to establish whether a trust includes both acute and community settings. Additionally, we were told that the arrangements for the care of patients in integrated trusts between acute and community sites can change often and HSCIC has no data about such changes or the extent to which deaths in those integrated trusts should be excluded. Following feedback from the Assessment team, as part of this assessment, HSCIC has included more information in its frequently asked questions (FAQ) publication⁵⁰ about this matter. The additional information explains the nature of the issue and goes on to explain the limitations of the statistics. The limitation arises because it is not possible to identify community activity in the HES dataset, which means that the statistics team is unable to estimate the number and identity of trusts affected by the issue, nor the potential impact on these trusts. HSCIC also warns that the number of affected trusts may increase over time as more trusts move to an integrated model of service provision and the impact is likely to vary depending on the nature of the community services provided. HSCIC has undertaken to continue to review this issue with its Technical Working Group as part of longer-term development.
- 3.18 Some users raised a concern with the Assessment team that SHMI methodology does not adjust sufficiently for the increased risk of death in patients with severe conditions, or for how ill a patient with a chronic condition may be. A user group cited an example to the Assessment team of a specialised cardiac unit treating patients with cardio-vascular disease who died subsequently. In such a unit, clinicians could expect the death rate to be higher because patients' conditions are more likely to be severe. However, the method used to calculate SHMI treats these deaths on the same basis as for patients with the same condition in a non-specialist unit; the statistics team does not

⁴⁷ http://www.hscic.gov.uk/media/14623/Library-of-Quality-Assured-Indicators/xls/Library_of_Quality_Assured_Indicators_08_12_14.xlsx

⁴⁸ Sponsorship provides NHS related business justification so there is a clear relationship in place with the NHS organisation commissioning the collection of the indicators

⁴⁹ In relation to Principle 4, Practice 2 and Principle 8, Practice 1 of the *Code of Practice*

⁵⁰ http://www.hscic.gov.uk/media/16112/SHMI-FAQs/pdf/SHMI_FAQ.pdf

adjust for them in calculating SHMI. The statistics team also told us that it has no means of identifying the acuity of patients' conditions in the dataset. However, it may be reasonable for a trust to conclude (after reviewing its SHMI data in detail) that an explanation for higher values in their SHMI is due to differences in case-mix not captured by the statistical model. The statistics team told the Assessment team that when HSCIC established SHMI, an important principle was that it should include deaths of all patients in all categories, whereas HSMR, for example, includes deaths only from the most serious life-threatening conditions. Following feedback from the Assessment team as part of this assessment, HSCIC has updated the Background Quality Statement in *SHMI* to explain why it does not adjust for how ill patients might be and why *SHMI* includes deaths in all categories within an acute setting. Additionally HSCIC has published more information in its FAQ documentation about the reasons for its decision to include in SHMI deaths in all categories.

- 3.19 The model for calculating the expected number of deaths uses data for 140 conditions to estimate the risk of mortality based on the characteristics of the patients (including the diagnostic condition for which the patient is in hospital, age, sex, comorbidities and method of admission to hospital). HSCIC uses a statistical measure (the C statistic⁵¹) for assessing whether the model possesses reasonable predictive ability in each of the 140 conditions. The statistics team provides some aggregate information in *SHMI* about how well its model predicts expected deaths across the conditions and points users to the Indicator Portal for more-detailed information about the predictive ability of the models for each of the 140 conditions. During the assessment, the Assessment team found that links in *SHMI* to information about SHMI model fit statistics did not lead directly to this information. Following feedback from the Assessment team as part of this assessment, HSCIC has updated the Background Quality Statement, which it includes in an annex to *SHMI*, to include more information about the C statistics for the statistical models, including a list of the diagnosis groups where the C statistic is less than 0.7.
- 3.20 The Assessment team found that the HSCIC statistics team had conducted an impressive range of research about known quality concerns about mortality indicators that may pose risks to the integrity of SHMI. One example of a known issue is where trusts with a propensity to record higher levels of co-morbidity are associated with artificially lower mortality indicators compared to trusts with a propensity to record less co-morbidity⁵². HSCIC shared with the Assessment team its recent research that showed that there is no correlation between depth of coding and SHMI. Additionally, the Assessment team found that some research was set out in the papers for TWG meetings. The Assessment team received feedback from users during the assessment that generally they were positive about their experiences of engaging with the statistics team. However, users were also frustrated about the difficulties of finding the information they were looking for on HSCIC's patient outcomes web pages. We suggested that HSCIC could make searching for this valuable information by users and

⁵¹ The C statistic determines the degree to which each factor predicts the death of the patient. A statistic of 1 for age would mean that the patient's age completely determined whether or not the patient died. A C statistic of 0.5 would mean there was no connection between age and the likelihood of death. Models are typically considered to be reasonable if the C statistic is 0.7 or higher

⁵² In medicine, comorbidity is the presence of one or more additional disorders or diseases co-occurring with a primary disease, or the effect of such additional disorders or diseases

researchers more straightforward. Specifically, we suggested that the statistics team publish a list of its research into suspected or known quality or methodological issues related to SHMI with links to the relevant papers. This suggestion has been implemented and a new Research and Development page has been added to the SHMI webpages of the HSCIC website⁵³.

Presentation of the statistics

- 3.21 In 2014, the statistics team made significant enhancements to *SHMI* after feedback from the National Statistician's Good Practice Team and from peer reviews by others in HSCIC. In its current form it presents an Executive Summary, an analysis of repeat outliers⁵⁴, analyses of contextual indicators such as those for palliative care coding, admission method, and deprivation. Additionally in the January 2015 *SHMI*, HSCIC presented analyses of SHMI data broken down by both trust and diagnostic groups⁵⁵ for the first time. *SHMI* also includes a summary against the European Statistical System Quality Framework⁵⁶ dimensions. This summary performs the useful function of outlining the methods and definitions used in compiling SHMI. It also provides helpful information about the coherence of SHMI in relation to the other standardised mortality indicators in use in the UK. The statistics team has also prepared a 'Frequently Asked Questions' guide and separate guidance for press teams and journalists⁵⁷. The statistics team is also exploring creating a video to help explain the use of SHMI. HSCIC publishes alongside *SHMI* interactive funnel plots that allow users to study the individual SHMI values within the plot. The Authority welcomes the actions taken by HSCIC to improve the presentation of *SHMI* and its efforts to mediate information about SHMI to a wider audience.
- 3.22 Whilst there have been noticeable enhancements to the presentation of *SHMI*, from our own review of *SHMI*, and reflecting on what users told us as part of this Assessment, key areas for development include:
- Improving the narrative accompanying the statistics, by drawing out those points that the informed reader would regard as the most interesting. SHMI are summary indicators and limited in their ability to provide, on their own, a narrative about overall patient safety performance of trusts in England. By the nature of the methods used to compile the statistics, the significant majority of trusts will have SHMI values that are in the 'as expected' band and smaller numbers in each of the other bands. HSCIC presents little commentary about whether the degree of variance between trusts has been narrowing over time. HSCIC presents information about the generic uses of

⁵³ <http://www.hscic.gov.uk/shmi-development>

⁵⁴ A trust that has either a 'higher than expected' SHMI value for both the most recent reporting period and the same period a year previously or is 'lower than expected' SHMI value for both the most recent reporting period and the same period a year previously.

⁵⁵ Diagnosis groups are the internationally recognised classifications for the condition from which a patient is diagnosed by a medical practitioner such as cancer

⁵⁶ The European Statistical System Quality Framework has five quality criteria: relevance; accuracy and reliability; timeliness and punctuality; coherence and comparability; accessibility and clarity:

<http://ec.europa.eu/eurostat/web/quality/quality-reporting>

⁵⁷ http://www.hscic.gov.uk/media/16114/SHMI-guidance-for-press-teams-and-journalists/pdf/SHMI_guidance_for_press_teams_and_journalists.pdf

the statistics, for example ‘...SHMI can be used by trusts to compare their mortality outcomes to the national baseline, with some caveats’ and gives no indications about the extent to which the analysis of SHMI statistics has contributed to improvements in patient safety. The restricted approach to narrative comment makes it difficult to paint a full picture about deaths associated with hospitalisation in England

- Informing users about whether evidence exists of a link between risk-adjusted mortality measures and other measures of quality. SHMI is not a measure of preventable deaths due to hospitalisation. Although *SHMI* explains that the indicators cannot be used to determine the numbers of preventable deaths it does not explain the contribution that SHMI statistics may have in preventing deaths due to hospitalisation. HSCIC could do more to discuss whether evidence exists of links between alerts due to high SHMI and changes in the subsequent profiles of trusts’ SHMI values
- Taking steps to avoid the use of value-laden terms. *SHMI* presents statistics about trusts that are termed ‘repeat outliers’. The Assessment team is concerned that the term ‘repeat outlier’ may seem pejorative, particularly when SHMI values outside of the 95 per cent band are an artefact of the SHMI methods. HSCIC provides general caveats about the risks of mis-interpretation if using SHMI alone and not taking into account other patient outcomes statistics. HSCIC does not reiterate these caveats in the footnotes to the tables of repeat outliers. We suggest that HSCIC review the appropriateness of using the terms ‘outliers’ and ‘repeat outliers’ in *SHMI* and examine whether more exact but appropriately descriptive terms may be used. We further suggest that, where statistics are presented in *SHMI* about whether a trust has repeatedly high or low SHMI values, HSCIC reiterate its advice to users not to use SHMI in isolation of other relevant information about the quality of care, and provide examples and links to other indicators, where available
- Including better information about the context within which HSCIC publishes SHMI. For example, it is not clear in *SHMI*, or related documentation, whether regulators use SHMI as one of their criteria for deciding whether a trust should be either placed in, or taken out of, special measures⁵⁸. Users told us that they find the range of patient outcomes statistics available from HSCIC and other organisations potentially overwhelming. Users would benefit from HSCIC placing SHMI in the wider context for example, in relation to other patient experience and patient outcomes statistics
- Drawing suitable comparisons between areas of the country. Despite recent *SHMI* showing that a very high proportion of the trusts with persistently lower than expected SHMI values being located in the London region, there is no comment about whether any regional patterns have emerged
- Providing better explanations about how these statistics relate to other statistics. HSCIC presents contextual indicators as figures but *SHMI* does not include narrative commentary or plausible reasons about why figures might have changed

⁵⁸ When there are concerns about the quality of care that hospitals are delivering, they can be put into special measures. Special measures are designed to offer the Trusts the support they need to improve, as well as giving the public the ability to hold them to account.

- Providing better explanation about the reasons why the statistics, despite being referred to as hospital-level, are in fact trust-level. Following feedback to the statistics team during this assessment, HSCIC told us that there might be scope to publish at hospital site-level. However, HSCIC has concerns about the accuracy of data about the site of treatment, in the HES dataset. Following this assessment, HSCIC now explains its concerns about the accuracy of the site-level data to users in *SHMI*. In addition, HSCIC explains to users that it is committed to continue to review the feasibility of reporting the SHMI at site level as part of the longer-term development of the indicator

- 3.23 As part of the designation as National Statistics HSCIC should improve the commentary in *SHMI* so that it aids users' interpretation of the statistics by
- a) clarifying the important messages, providing plain language descriptions and narrative about any longer term trends, for example whether variance in trusts' SHMI compared with the national average has reduced over time and the degree to which regional patterns are emerging
 - b) highlighting the types of measures that trusts have taken to bring down their hospital-related mortality
 - c) providing further explanatory information particularly about persistent outliers (Requirement 4).

As part of meeting this requirement, HSCIC should consider the points detailed in annex 1 and annex 2⁵⁹.

- 3.24 In meeting this Requirement, we suggest that HSCIC provide further explanatory information about SHMI for trusts that have been and remain in special measures. We further suggest that HSCIC work with DH and NHS England, and with other data provider bodies as relevant, to identify the operational and policy issues that affect SHMI and provide helpful explanatory information about wider findings alongside its own statistics.

Enabling and encouraging analysis and re-use of the statistics

- 3.25 The Assessment team found that following a link in *SHMI* to trust-level data held within HSCIC's Indicator Portal not to be straightforward. Users also told the Assessment team during the Assessment that they had had trouble locating information through HSCIC's website and Indicator Portal. HSCIC told us that it is planning, as part of its wider benefit realisation activities, to develop the Indicator Portal and this is being informed by the results of the consultation of the Publication Strategy published in December 2014. Following feedback from the Assessment team as part of this assessment, the statistics team has improved the signposting for each table presented in *SHMI* to the particular tables in the Indicator Portal where the data may be found, downloaded, and reused.

⁵⁹ In relation to Principle 8, Practice 2 of the *Code of Practice for Official Statistics*

Annex 1: Compliance with Standards for Statistical Reports

- A1.1 In November 2012, the Authority issued a statement on *Standards for Statistical Reports*⁶⁰. While this is not part of the *Code of Practice for Official Statistics*, the Authority regards it as advice that will promote both understanding and compliance with the *Code*. In relation to HSCIC's *Summary Hospital-level Mortality Indicator – Deaths associated with hospitalisation, England*, this annex comments on compliance with the statement on standards. The comments included in this annex are based on a review of *SHMI* for July 2013 to June 2014 published on 27 January 2015⁶¹.
- A1.2 In implementing any Requirements of this report (at paragraph 1.10) which relate to the content of statistical reports, we encourage HSCIC to apply the standards as fully as possible.

Include an impartial narrative in plain English that draws out the main messages from the statistics

- A1.3 The main messages are at the start of the report but the points are not necessarily those that the informed reader would regard as the most interesting and relevant to public debate. The statistics team presents a good explanation of how to interpret the statistics. HSCIC does not discuss comparisons between different areas within the country, nor trends over time, in *SHMI*. This makes it difficult to paint a full picture about the subject of the statistics – deaths associated with hospitalisation in England. The statistics team presents the text in *SHMI* impartially and we found it demonstrably evidence-based, avoiding statements of opinion. *SHMI* is numbers-heavy, although HSCIC suitably round such numbers (to one decimal place). However, we found that SHMI values, when quoted in Trust Quality Accounts and on NHS Choices, can be quoted to four decimal places, projecting an inappropriate accuracy. Graphs and tables are included in *SHMI* to help interpret the statistics. *SHMI* includes a useful glossary of terms and table of contents at the beginning of the report. The language used in some parts of the report can be quite technical and difficult to interpret for the less-expert user.
- A1.4 HSCIC has included some references to published research that helps to explain the choices made in respect to the methods used to compile the statistics. The SHMI web page provides links to the proceedings of the Technical Working Group as well as to a Methodology Development Log. These provide a valuable insight into the different challenges that have occurred in improving and developing SHMI and in pointing to potential changes in the future. However, researchers might be unaware of the analysis contained within the TWG papers. HSCIC could better brigade and categorise the relevant links to research in *SHMI* to help users find relevant information more readily.

⁶⁰ <http://www.statisticsauthority.gov.uk/news/standards-for-statistical-reports.html>

⁶¹ <http://www.hscic.gov.uk/catalogue/PUB16479/shmi-deat-hosp-eng-jul-13-jun-14-rep.pdf>

Include information about the context and likely uses of the statistics

- A1.5 *SHMI* details a clear description of what is measured as well as providing a good explanation of the concepts. Additionally, HSCIC presents statistics on contextual indicators, which users need to fully understand the statistics. An example is the contextual indicator about the extent of palliative care that patients have received, as this may influence how many patients might die and when they might die after hospitalisation.
- A1.6 A background quality report included in *SHMI* covers how relevant the statistics are in meeting users' needs but provides more information about the specification of SHMI rather than how SHMI are used and what kinds of decisions people take based upon the statistics.

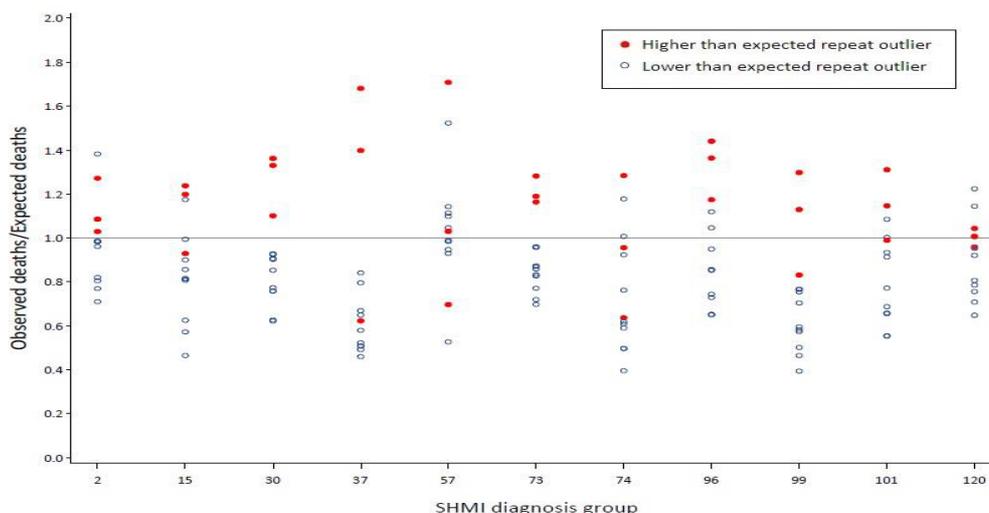
Include information about the strengths and limitations of the statistics in relation to their potential use

- A1.7 HSCIC bases the expected deaths statistics on its regression models. HSCIC discusses the accuracy and reliability of the statistics in a background quality report within *SHMI*. There is scope for the background quality report to be more informative about some important aspects of the uncertainty in the statistics, such as limitations in the classifications of data, modelling and assumptions made. The background quality report also includes descriptions of many of the likely errors and their potential impact on the statistics, and their implications for use. The statistics team gives some information about the strengths and limitations of the statistics in relation to their potential uses, in order that users may use the statistics appropriately. The information that HSCIC provides goes some way to reducing the risk of inappropriate use of SHMI.
- A1.8 HSCIC does not revise these statistics.

Be professionally sound

- A1.9 Most of the charts and tables conform to good practice standards. However, there are some confusing tables and charts for example Figure 11 which is a chart perhaps more suited to topic specialists than less expert users and is reproduced here.

Figure 11: Ratio of observed to expected deaths for eleven of the SHMI diagnosis groups for Trusts which are repeat outliers, July 2013 - June 2014



Source: HSCIC - Summary Hospital-level Mortality Indicator (SHMI) – Deaths associated with hospitalisation England, July 2013 – June 2014: Quarterly Report⁶²

Include, or link to, appropriate metadata

A1.10 The title of the statistical report is not entirely accurate in that it describes SHMI as being a hospital-level Mortality Indicator when SHMI actually reports at trust level. HSCIC could explain this distinction better in *SHMI* and advise users to be careful in checking when they see SHMI values reported for a hospital (outside of the statistical report, for instance on a web page) whether the SHMI value relates to the entire trust.

A1.11 *SHMI* does explain in plain English the coverage of the statistics and the point in time or period to which the latest statistics relate. *SHMI* includes a statement about the frequency of release but does not include an indicative timing for the next release. However, HSCIC publishes a release calendar on the SHMI landing page⁶³ of its website.

A1.12 HSCIC does not give contact details of the statistician but does provide the enquiries contact centre details, which routes queries through to the statistics team. SHMI provides information and links to information about definitions, data sources and methods. HSCIC has published a Frequently Asked Questions paper and a media guide to SHMI, which are accessible from the SHMI landing page of its website. *SHMI* gives information in an annexed background quality report about the difficulties of comparing the England average SHMI over time and warns against comparing one trust’s SHMI to others. It also provides links to hospital-level mortality statistics for Wales and Scotland – there are no such statistics published for Northern Ireland. HSCIC provide links to SHMI data at trust level but these links do not lead directly to trust-level data but to the Indicator Portal. HSCIC expects users to navigate further once they find the particular part of the Indicator Portal to find trust-level data. *SHMI* does not

⁶² <http://www.hscic.gov.uk/catalogue/PUB16479/shmi-deat-hosp-eng-jul-13-jun-14-rep.pdf>

⁶³ <http://www.hscic.gov.uk/article/1817/Publications-Calendar-April-2012---March-2013>

signpost users to where they might find the data presented in each table in the Indicator Portal. This may impede easy access to, and ready re-use of, the statistics.

A1.13 *SHMI* currently presents two contextual indicators on palliative care to support the interpretation of the SHMI. The HSCIC statistics team also publishes on the SHMI landing page a report on the use of *Palliative Care Coding in the Summary Hospital-level Mortality Indicator*⁶⁴. HSCIC presents statistics on the association between admission method (elective and non-elective) and SHMI values. HSCIC told us that it plans to present information on SHMI classified by weekday and weekend admissions.

⁶⁴ http://www.hscic.gov.uk/media/11150/Palliative-Care-Coding-Report/pdf/Palliative_Care_Coding_Report.pdf

Annex 2: Summary of assessment process and users' views

- A2.1 This assessment was conducted from September 2014 to March 2015.
- A2.2 The Assessment team – Iain Russell and Pat Macleod – agreed the scope of and timetable for this assessment with representatives of HSCIC in September 2014. The Written Evidence for Assessment was provided on 21 November. The Assessment team subsequently met HSCIC during January 2015 to review compliance with the *Code of Practice*, taking account of the written evidence provided and other relevant sources of evidence.

Summary of users contacted, and issues raised

- A2.3 Part of the assessment process involves our consideration of the views of users. We approach some known and potential users of the set of statistics, and we invite comments via an open note on the Authority's website. This process is not a statistical survey, but it enables us to gain some insights about the extent to which the statistics meet users' needs and the extent to which users feel that the producers of those statistics engage with them. We are aware that responses from users may not be representative of wider views, and we take account of this in the way that we prepare Assessment reports.
- A2.4 As it was known that some of the users that we planned to approach would have an interest in the range of patient outcomes statistics we invited comments about all of the sets of statistics in this group of assessments of patient outcomes statistics as part of a single user consultation. We received 29 responses and the respondents were grouped as follows:

NHS England	4
NHS trusts	4
Department of Health	3
Professional and Membership Bodies	3
Regulators	2
Public Health England	2
Office for National Statistics	2
Commercial	2
Charities	1
Academics	1
Data Suppliers	5

Common Themes

- A2.5 Users of patient outcomes statistics identified with some common themes:
- Volume of statistics and data – Users appreciated the availability of statistics and data about patient outcomes and experiences and said that this is an area of increasing policy and operational focus within the health sector (see Section 2). However, users indicated that the range and volume of different data and statistics available from different sources can be overwhelming. Users said that it is difficult to know what statistics best serve particular

needs and to determine the coherence and comparability of the different statistics.

- Accessibility – users told us that they found it difficult to locate and navigate the range of patient outcomes statistics and supporting datasets. Users told us that they would welcome better search functionality and one user suggested that an app be developed that would explain what statistics and data are available for different themes and where to find them. Users were particularly critical of HSCIC’s website and the layout and functionality of its Indicator Portal. Users said that when they found what they wanted, the format and presentation of spreadsheets made it difficult to interpret and re-use the data. Some users also highlighted that often the greatest value lies in the individual record-level data, which is more difficult to access, though they noted the importance of protecting confidentiality
- Commentary - some users only used the data and did not refer to the commentary; others found the commentary helpful; but some users told us that they would welcome more insightful commentary and trend analysis to aid interpretation
- Timeliness - some users in NHS trusts told us that hospitals thrive on real-time information, and that the delayed availability of statistics reduces their relevance
- Assurance of source data - suppliers provided details of a range of checks carried out on the data but some users and suppliers raised potential concerns about the quality of the data and administrative processes that underpin the statistics - issues raised included: patchy response rates to patient surveys; limitations caused by the different organisational structures in the NHS; the potential for different interpretations of definitions; and the lack of information available to inform the sign off processes by trusts and Clinical Commissioning Groups (CCGs)
- Engagement with producer bodies - those users who had direct contact with the teams producing the statistics were positive about their experiences and the helpfulness of the statistics team

SHMI

A2.6 Users also provided specific feedback in relation to *SHMI*. Important points were:

- SHMI statistics may be inconsistent with other mortality statistics. For example, in October 2014, the SHMI value for one hospital was among the best in the country. Based on the SHMI details on the trust’s website, the conditions that have the lowest mortality rates in the trust are for respiratory conditions. However, the local communities that the hospital serves have some of the highest percentages of deaths that are amenable to health care and attributable to respiratory disease
- It can be difficult to discern whether changes in the data relate to real clinical issues rather the data processes or methodology matters
- Ideally there would be a system to bring together the different indicators of mortality in one place

- There is a lack of functionality when using this data compared with mortality data from alternative providers. There are often many windows to click through and it can be difficult to find the actual data. Once the appropriate spreadsheet is located, it is not very user-friendly. A user told us that for this reason, they rarely use HSCIC SHMI statistics directly, the user would rather access statistics via the Healthcare Evaluation Data system (HED) provided by University Hospital Birmingham
- One user said it would be helpful to supply total number of inpatient deaths by all causes and for a common approach to be adopted in reporting expected and unexpected deaths to inform end-of-life care and patient safety work

Key documents/links provided

Written Evidence for Assessment document

Annex 3: NHS delivery services

A3.1 Once commissioned, NHS delivers services through a range of organisations called providers. The NHS predominantly refers to provider organisations as trusts, which it classifies as NHS Foundation Trusts or NHS Trusts:

Differences between NHS foundation and NHS trusts		
	NHS foundation trust	NHS trust
Government involvement	Not directed by government, therefore more freedom to make strategic decisions	Directed by government
Regulation: Financial Quality	Monitor CQC	Trust Development Authority CQC
Finance	Free to make their own financial decisions according to an agreed framework set out in law and by regulators. Can retain and reinvest surpluses	Financially accountable to government

Source: NHS England – Understanding the New NHS⁶⁵

A3.2 Delivery of NHS Services involves:

- **Primary care services** –delivered by a wide variety of provider including general practices, dentists, optometrists, pharmacists, NHS walk-in centres and NHS 111. More than 7,500 general practices exist in England to provide primary care services
- **Acute trusts** provide secondary care and more specialised services. CCGs commission the majority of activity in acute trusts. However, NHS England commissions some specialised services centrally
- **Ambulance trusts** manage emergency care for life threatening and non-life threatening illnesses, including the NHS 999 service. In some areas, the ambulance trusts are commissioned additionally to provide non-emergency hospital transport services and / or the NHS 111 service
- **Mental health trusts** provide community, inpatient and social care services for a wide range of psychiatric and psychological illnesses. Mental health trusts are commissioned and funded by CCGs. Mental health services can also be provided by other NHS organisations, the voluntary sector and the private sector
- **Community health services** – delivered by foundation and non-foundation community health trusts. Services include district nurses, health visitors, school nursing, community specialist services, hospitals at home, NHS walk-in centres and home-based rehabilitation

⁶⁵ <http://www.england.nhs.uk/wp-content/uploads/2014/06/simple-nhs-guide.pdf>

