

# Using the Hospital Standardised Mortality Ratio to help improve patient care

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A guide for NHS boards

August 2014

Prepared by Healthcare Improvement Scotland, Public Health & Intelligence of NHS National Services Scotland, Scottish Patient Safety Programme.

A number of NHS boards also contributed to the preparation of the initial guide/toolkit published in 2011, and in particular we acknowledge the contribution from Dr Simon Mackenzie and Dr Elizabeth Bream (NHS Lothian), Dr Gordon Birnie (NHS Fife) and Ms Diane Campbell (NHS Tayside).

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## Foreword

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The Hospital Standardised Mortality Ratio (HSMR) is a potentially valuable tool in reducing the incidence of avoidable mortality in our acute hospitals. Its construction and use are the subject of continuing controversy and debate, however, and this document seeks to contribute to that ongoing discussion and to provide a helpful resource for NHS boards.

In response to feedback from NHS boards, we have prepared this guide on how to use the HSMR and, more importantly, how studying mortality is being linked to improvement in Scotland.

The guide, which incorporates a toolkit, has been prepared by Healthcare Improvement Scotland, Public Health & Intelligence (formerly known as Information Services Division), the Scottish Patient Safety Programme, and with input from NHS boards.

A previous version of the guide was published in 2011, and this version is up to date at time of publication. However, the use of HSMR (and wider metrics of quality) will continue to evolve as the science underpinning the construction and analysis of the HSMR develops.

We would encourage all NHS boards to consider this guidance against their existing local processes and procedures, and to test the suggested approaches where possible.

We hope this guide is of practical use to your NHS board, and any feedback would be gratefully received. Please pass any comments or suggestions to Dr Donald Morrison at [donald.morrison@nhs.net](mailto:donald.morrison@nhs.net)

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## About this guide

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Most deaths following admission to hospital are inevitable, and are due to the patients' condition when they are admitted. Some deaths can be prevented, however, by improving care and treatment or by avoiding harm. Death is recorded accurately and consistently so hospital mortality statistics provide an opportunity for the health service to get a better understanding of how patient care is delivered. Used wisely, such information can highlight aspects of care that can be improved, to make care better for patients and their families.

The Hospital Standardised Mortality Ratio (HSMR) is one such tool for examining mortality. Many countries are now using the HSMR (or an equivalent) as a tool to help monitor hospital mortality and identify opportunities for improving patient care. Nonetheless, the way that the HSMR is produced is not straightforward, and there is continuing debate internationally on how the HSMR is constructed and used. The statistical model underpinning the Scottish HSMR will not change before December 2015, as it is being used for national monitoring for the Scottish Patient Safety Programme. Beyond 2015, the way the HSMR is produced and used in Scotland will evolve over time as we continue to learn more. If not understood properly, or if used inappropriately, the HSMR could even be counterproductive (for example if used to make unfair snapshot judgements about the quality of care).

Every hospital should monitor its HSMR, review deaths systematically, and have an improvement plan to make sure that systems of care are improved in light of lessons learned. This guide (including a toolkit) has been produced to give the health service in Scotland clear advice on how to understand, interpret and use the Scottish HSMR. The target audience for this guide comprises the various different people within hospitals and NHS boards who are carrying out work to reduce hospital mortality.

If measurement is to make a valuable contribution to wider efforts to improve patient care, then there are important issues to address on:

- the technical aspects of data collection, analysis and presentation, and
- how the data are used in practice to facilitate improvement.

This guide covers both these areas, and includes step-by-step guidance on how to use the HSMR together with links to some practical tools.

## About the HSMR

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### Why is measurement important?

It has become increasingly recognised worldwide that measurement has a pivotal role to play in driving improvement in patient care and clinical outcomes. Health services need a range of data to get a better understanding of how care is being delivered, where systems of care are working well, and where improvements to safety and effectiveness of care are required. In Scotland, the critical role of measurement is explicitly identified in the Healthcare Quality Strategy for NHSScotland.

### Why standardise mortality rates?

Data on hospital mortality have an important role to play in stimulating reflection on the quality of patient care. The overall mortality rate for a hospital will be affected by a number of factors, only one of which is the quality of patient care. In fact, it is difficult to learn much from comparing the actual mortality rates between hospitals or units because this is affected by the characteristics of the patients admitted, usually referred to as case-mix. Standardisation is used to adjust for this.

### What is the HSMR?

The HSMR is a measurement tool where crude mortality data are adjusted to take account of some of the factors known to affect the underlying risk of death. For Scottish hospitals these include:

- primary diagnosis
- age
- gender
- where the patient was admitted from
- number and severity of prior morbidities (requiring admission to hospital) in the previous year/previous 5 years
- number of emergency admissions in the previous year
- whether they were admitted as an inpatient or day case, and
- type of admission (elective/non-elective).

The HSMR is calculated as the ratio of the actual number of deaths within 30 days of admission to hospital (irrespective of place of death) to the predicted number of deaths:

$$\text{HSMR} = \text{observed deaths/predicted deaths}$$

The predicted probabilities of death are based upon national activity using October 2006 to September 2007 as the baseline year.

## What does the value of the HSMR mean?

An HSMR value of greater than 1 means that more deaths occurred than predicted, and an HSMR value of less than 1 means that fewer deaths occurred than predicted. This does not necessarily mean that the care was poor (or good), or that lives were lost (or saved). The HSMR is a useful model, but not a perfect one. There will be a normal variation in the ratio over time and we do not expect to see a value of exactly 1.0 very often.

The HSMR (or an equivalent) is being used in many countries, including Australia, the United States, Canada, the Netherlands, England and Scotland. Different countries use different methodologies to produce the HSMR, often due to differences in the underlying data sources. This means that HSMRs from different countries cannot be compared easily.

## What data are used to produce the Scottish HSMR?

In Scotland, the HSMR is produced from routine administrative data sources. These are:

- information that hospitals submit to Public Health & Intelligence (PHI) of NHS National Services Scotland about patients discharged from hospital (SMR01 records), and
- death records held by the National Records for Scotland (formerly the General Register Office for Scotland).

In order to adjust for the primary diagnosis, over 800 diagnoses are categorised into 26 diagnostic groupings, each of which has a different weighting. This raises two issues. First, this inevitably creates some imprecision. Second, the accuracy of the model's predictions varies between the 26 groupings, so that while the model predicts well over the Scottish population as a whole, there is the potential that a hospital with an unusual case-mix might have an unusually high or low HSMR.

## Where can I find out more about how the HSMR is produced?

The HSMR for Scottish hospitals is published on the website of PHI (go to [www.isdscotland.org](http://www.isdscotland.org), select A-Z index and then HSMR). More information about how the HSMR is calculated is available from these web pages. There are also some frequently asked questions (and their answers) about the HSMR at the end of this guide.

## How to review the HSMR

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As with any measure there can be value in both comparing your performance with others, and with monitoring trends over time. In both cases the data need to be interpreted taking account of other information available.

### Reviewing a hospital's HSMR over time

The HSMR can be a real motivator for change, and all hospitals should ask 'How can we use these data to learn and improve?' When tracked over time, the HSMR can be used to help a hospital understand how successful it has been in improving some elements of care and reducing deaths that were potentially preventable. A target of a 20% reduction in the HSMR between January 2008 and December 2015 has been set by the Scottish Patient Safety Programme.

HSMR data over a period of time should be reviewed within all hospitals, and used as an aid to driving improvement. When doing so there are specific patterns which may be of particular interest. For example, if the HSMR for a particular quarter is substantially greater than the average (mean) for the hospital, then this should be considered locally in case this reflects important events at that point in time. The only inference that can safely be drawn though is that there is a need to look into this locally to understand what factors are contributing to the variation in the data, and which may or may not be related to the quality of patient care. Other patterns that should be investigated locally include trends or shifts in the data over time. In the context of an observed decrease across Scotland of around 14% between January 2008 and March 2014, a flat time series (that is, no change) in an individual hospital should also generate questions.

### Comparing different hospitals' HSMRs

The HSMR should not be used to rank different hospitals. However, in theory the construction of the statistic means that an individual hospital's HSMR can be compared with the average for Scotland - indeed this is basically why raw mortality data are standardised in the first place. In reality, however, even comparing an individual hospital's HSMR with the national average may not be straightforward.

When comparing data with a number of hospitals, there will be natural variation in the values. It is therefore important to test whether the apparent differences are statistically significant. Even when they are, there may be various explanations for the difference. Firstly, there may be inconsistencies in how hospitals assign clinical codes to individual patients and extract these codes from clinical records and record them on SMR01. Secondly, the generation of an HSMR for an individual hospital standardises mortality against the whole of Scotland, not against other hospitals. Thirdly, it is important to recognise that case-mix adjustment techniques are useful, but necessarily imperfect. This is mostly because the model can only adjust for those factors recorded on SMR01 (as highlighted earlier). For example, the provision of palliative care varies greatly across Scotland, but is not currently captured in a codified manner from routine hospital data.

This all means that comparing an individual hospital's HSMR with the Scottish average

requires caution. What is absolutely clear is that it is not possible to draw conclusions about which hospital provides better or safer patient care. Attempting to do so could easily result in incorrect conclusions being drawn, which in turn could have an adverse (and unwarranted) impact by stigmatising individual hospitals, and by lowering staff morale and public confidence, or jeopardising the safety of care by providing false reassurance.

Despite these significant caveats, it would be inappropriate for the health service in Scotland not to look at how the HSMRs for individual hospitals compare with the Scottish average and their own historical trajectory. This is because the data could potentially draw attention to areas that, at the very least, are worthy of further consideration. If a problem with clinical care in a hospital went unrecognised, and it could have been identified by analysing HSMR data, then the public could rightly ask why this information was not acted upon. That is why PHI and Healthcare Improvement Scotland review each release of HSMR data and will contact NHS boards on occasion to ensure that such action is occurring.

Such comparisons should only serve as a prompt to look at specific areas of service delivery and care more closely, and should not be used as a basis for making judgements about the relative quality of care. Using the HSMR to produce a meaningful league table of hospitals would be impossible, given the great differences in case-mix between hospitals.

## Summary

A principal value of the HSMR lies in reviewing the data for an individual hospital over a period of time. A healthcare provider should continuously review its HSMR data, being aware of how the HSMR changes over time and using this information to contribute to wider efforts to improve patient care. Comparisons between an individual hospital's HSMR and the Scottish average should be interpreted with caution. There is natural variation in any process, and this is normally described as 'common cause' which is expected. However, when a process displays abnormal variation, 'special cause', its source should be investigated further and understood. Healthcare Improvement Scotland and PHI are available to support boards in the interpretation of local and national data.

## How to respond to the HSMR step-by-step

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All hospitals have opportunities to improve the care they provide for patients. Therefore, while hospitals with a relatively high or increasing HSMR will have particular cause to review and respond to this measure, all hospitals should use the HSMR and related data to contribute to, and monitor, their wider efforts to improve patient care. It is recommended that the following steps are followed when using the HSMR – these should mostly be initiated in parallel, rather than carried out in sequence.

### Step 1: Get a good understanding of your data

In order to contextualise the HSMR, and guide further investigative and improvement work locally, it is helpful to look at additional sources of information and data. This includes locally collected data and data available on a national basis.

PHI now provides a more detailed breakdown of the HSMR data through a dashboard. NHS boards should become familiar with this as it can provide supplementary data that includes a breakdown of the HSMR by primary diagnostic grouping, specialty, age group, and admissions type (emergency/elective). It should be noted that the analyses become less reliable the more they are broken down and numbers of cases get smaller. These analyses should only be used as an indication of potential areas for further investigation. PHI can also provide a full case listing of deaths, ranked by probability of death according to the statistical model used to produce the HSMR.

Getting a good understanding of your data includes looking into how accurate and complete the SMR01 data are. This is more than simply ‘coding’. The HSMR analyses are based on information that hospitals routinely submit to PHI, and so the accuracy of a hospital’s HSMR will be influenced by the completeness, accuracy and timeliness of discharge summaries and local coding activities. This includes the level of detail documented that can, therefore, be extracted by clinical coders. Any problems with SMR01 data that are identified should be rectified, and this should be done in parallel with other activities designed to look into and improve care systems. It is important not to assume that improving data is the only action required. Identified coding problems, while having the potential to contribute to the pattern of HSMR data, are not a valid reason for failing to seek to improve patient care. It should also be noted that the quality of information contained in discharge summaries is important for clinical care at transition points (for example transfer from secondary care to primary care or from one hospital to another). One step that a hospital might wish to take is to look at its crude mortality data and seek to reconcile this with the denominator for the HSMR.

### Step 2: Review deaths systematically

Every hospital should have a systematic approach for reviewing deaths in depth. Healthcare Improvement Scotland and PHI are working with NHS boards and the Colleges to develop a ‘Scottish Mortality Review Process’ to support a reliable, comprehensive review of deaths in hospitals. This work will report in 2015 and guidance will be produced in due course. Some hospitals have a system whereby all deaths are reviewed. As well as ensuring no deaths are missed, this could support a prospective and preventative approach as opposed to a system for which a cohort or sample of deaths to be reviewed is identified retrospectively. Smaller hospitals should be able to review every death in detail.

Other hospitals might prefer to identify a cohort of deaths to be reviewed, and there are

various approaches that can be taken for doing this. These include:

- reviewing the fifty most recent consecutive deaths at least once a year, using the 3x2 matrix tool to screen cases and identify those to prioritise for reviewing in depth
- randomly selecting an agreed percentage of deaths, and
- using the full case listing (including underlying cause of death) provided by PHI to identify deaths to review.

If looking at a case listing, it might be intuitively appealing to focus on cases where the predicted probability of death was low. However, the predictive power of the statistical model generating such lists is at the level of the cohort of patients – and not at the level of individual cases. Therefore, focusing on patients that were most unlikely to die (for example, less than 5% probability), as previously advised, might not be the best way to learn about how care can be improved. These cases might, however, shed more light on discharge summary/coding problems, and also on where the case-mix adjustment is not reflecting local practices (learning about the latter can help improve the model). Instead, it might be worth focusing on a sample of cases where the predicted probability of death was around 50% or less.

Once a provisional group of deaths to be reviewed has been identified, one option is to use the Global Trigger Tool (used within the Scottish Patient Safety Programme) to prune this to a more focused cohort that should be reviewed in depth. This is a validated tool for looking for potential harm that may have occurred during an episode of care.

The in-depth review of a case should be multidisciplinary, and have input from at least one clinician who is independent from the case under consideration. The detailed case reviews can then be used to identify themes that will enable an improvement plan to be produced. Themes might include management or prevention of healthcare associated infection, the care protocols for cardiac arrest, or systems for identifying and managing the deteriorating patient. Case reviews can also help drive improvement by providing direct feedback to the clinicians involved, and so it is important that the process for carrying out such reviews is robust and transparent.

“ NHS Tayside  
The review is an extremely helpful and powerful way to help identify how we can improve the care we deliver to patients and learn from our findings.”

### Step 3: Put an improvement plan in place

In-depth case reviews will identify aspects of care that could be improved, and these can be used to construct a local improvement plan. A driver diagram is one method for developing an improvement plan, and ensures that the aims are clear and directly connected, through a logical and structured approach, to the actions taken.

Improvement has to be a multidisciplinary process involving staff with improvement and governance roles as well as clinical and management colleagues in developing, implementing and assessing an improvement plan. Progress in relation to the improvement plan should be monitored by the local clinical governance system.

“ NHS Fife  
HSMR is one of a number of complex indicators which Boards need to understand and may help them to drive improvements in the care that they provide to patients.”

## **What happens if a hospital has a high or increasing HSMR?**

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All hospitals should review and use the HSMR to help improve the quality of patient care. In addition, if a hospital signals as having a relatively high or increasing HSMR then Healthcare Improvement Scotland will initiate a dialogue with the NHS board in question, in line with a standard interaction procedure. In doing so, the NHS board will be encouraged to interpret its own data locally, recognising that knowledge of the local context is necessary to do this properly.

The NHS board in question will be asked to describe how its data are being reviewed locally, what its interpretation of the data is, and what actions will be carried out to respond to any issues identified. A small expert panel will support the NHS board by reviewing the proposed course of action and/or providing advice on further actions. This dialogue is focused on improvement, but also enables Healthcare Improvement Scotland to seek confirmation that the NHS board is taking the necessary steps.

It is for an individual NHS board's own clinical governance system to monitor its improvement plan. However, if Healthcare Improvement Scotland has any serious concerns about the clinical care or clinical governance within an NHS board, then there is scope for this to be escalated to the Scottish Government.

Healthcare Improvement Scotland may initiate a dialogue with an NHS board if a hospital is identified as having: a high quarterly HSMR value compared with the national average or its own historical average values; an increasing trend over time, or; a series of HSMR values which are consistently above the hospital's median. Healthcare Improvement Scotland will also be looking to understand the potential development of learning from NHS boards with low HSMR and the use of a wider suite of measures, as HSMR itself is not an absolute measure of quality.

## HSMR toolkit

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As described in this guide, the following tools might be of use to Scottish hospitals in their efforts to reduce their mortality and improve the quality of patient care. All tools listed here can be accessed from tools and resources on the website of the Scottish Patient Safety Programme: [www.scottishpatientsafetyprogramme.scot.nhs.uk/programmes/acute-adult](http://www.scottishpatientsafetyprogramme.scot.nhs.uk/programmes/acute-adult)

Sample mortality reduction driver diagrams and change packages. *Including those developed by NHS Fife and NHS Tayside (the latter is accompanied by a flow chart for carrying out a mortality review within the medical directorate).*

NHS Modernisation Agency. 3x2 matrix tool: to identify care issues around patients who die in hospital. *This is a mortality audit and clinical governance tool that is designed to facilitate improvements in patient care by identifying problems with healthcare systems.*

Institute for Healthcare Improvement. Global Trigger Tool for measuring adverse events (UK version). *This tool is designed to be used during retrospective case reviews in order to identify possible adverse events.*

### Other resources and further reading

PHI of NHS National Services Scotland. HSMR analyses for Scottish hospitals, and supplementary information, are available from [www.isdscotland.org](http://www.isdscotland.org) (select A-Z index and then HSMR).

Healthcare Improvement Scotland. The Hospital Standardised Mortality Ratio in Scotland (HSMR): Recommendations from a Short Life Working Group. [www.healthcareimprovementscotland.org/our\\_work/patient\\_safety/hsmr/hsmr\\_recommendations.aspx](http://www.healthcareimprovementscotland.org/our_work/patient_safety/hsmr/hsmr_recommendations.aspx)

NHS Information Centre. Summary Hospital-level Mortality Indicator for English Trusts – data and supplementary information are available from [www.ic.nhs.uk](http://www.ic.nhs.uk) (select product A-Z, then Summary Hospital-level Mortality Indicator from the drop down menu).

Department of Health. Report from the steering group for the National Review of the Hospital Standardised Mortality Ratio.

Paul Aylin et al. Strengths and weaknesses of hospital standardised mortality ratios. *British Medical Journal* 2010 Jan 21;342:c7116. doi: 10.1136/bmj.c7116

Institute for Healthcare Improvement. Move your dot: measuring, evaluating, and reducing hospital mortality rates. Description of a methodology designed to help a health care provider understand its mortality rate and plan improvements.

Lau H, Litman KC. Saving lives by studying deaths: Using standardized mortality reviews to improve inpatient safety. *Joint Commission Journal on Quality and Patient Safety*. 2011 Sep;37(9):400-408.

Taylor, Paul. London Review of Book: rigging the Deat Rate. A crisis in the NHS. 2013 April 11

## **Suggested questions for Board members to ask**

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The National Patient Safety Agency has published seven questions that every Board member should ask about patient safety.

To complement these, Board members might find it helpful to ask the following questions about the HSMR and reducing hospital mortality.

- Do we systematically review and learn from hospital-related deaths?
- Do we actively review/use the HSMR?
- Do we have the right supplementary information to help us use the HSMR?
- Do we have an improvement plan for reducing hospital-related mortality?
- Are hospital discharge summaries accurate and complete?
- Do we have a good understanding of what's causing the patterns in our HSMR data?
- Has work on the HSMR drawn attention to any causes for concern or areas of good practice?

## Frequently asked questions

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**Q: Which hospitals should use the HSMR?**

**A:** Every hospital should monitor its HSMR, review deaths systematically, and have an improvement plan to make sure that systems of care are improved in light of lessons learned. This is because every hospital has opportunities to improve the quality of patient care.

**Q: If a hospital has a high HSMR, does this mean that the hospital is providing poor quality or unsafe care?**

**A:** No. A high HSMR does not necessarily mean that the quality of care is poor or that services are unsafe. This is because there are a number of factors that can contribute to the HSMR. A high HSMR could also reflect an atypical case-mix for the hospital or clinical coding inaccuracies. If a hospital has a high HSMR then it needs to look into this locally to understand what factors are causing this. Attempting to draw conclusions about the quality of patient care from the HSMR could easily result in incorrect conclusions being drawn. This in turn could have an adverse (and unwarranted) impact by stigmatising individual hospitals, and by lowering staff morale and public confidence, or jeopardising the safety of care by providing false reassurance.

**Q: If a hospital's HSMR is decreasing (or increasing), does this mean the quality of patient care is getting better (or worse)?**

**A:** Not necessarily. Changes in the quality of patient care might well impact on the patterns observed on the HSMR. However, other factors might also impact on this. These include a reconfiguration of clinical services (for example taking on more emergency cases) and changes to how hospital discharge summaries are produced. The potential contribution of all these factors needs to be taken into account when interpreting the HSMR.

**Q: Can the HSMR be used to make meaningful comparisons between different hospitals?**

**A:** No. The HSMR should not be used to make inter-hospital comparisons. However, an individual hospital's HSMR can be compared with the Scottish average, although even this comparison needs to be made with caution. A principal value of the HSMR lies in reviewing the data for an individual hospital over a period of time.

**Q: Can the HSMRs from different countries be compared with one another?**

**A:** The HSMRs produced by different countries are not directly comparable. This is because there are important differences in the statistical models that different countries use to produce the HSMR. Some of these are by choice, but many are constrained by the underlying data available.

**Q: Given the caveats associated with the HSMR, is there any value in looking at this measure?**

**A:** Yes. Despite the complexities, the HSMR can be a real motivator for change and improvement – and it is a useful lens through which to view systems of care. As already explained, the real value of the HSMR lies in reviewing the data for an individual hospital over a period of time. In Scotland, a number of organisations are working together on this topic, and over time this will allow us to develop a better understanding of exactly how the HSMR can add value to our health service.

**Q: Does the HSMR only capture deaths within hospital?**

**A:** No. Deaths within 30 days of admission to hospital are covered, including deaths within a hospital and those outwith a hospital.

**Q: Does the HSMR capture all deaths in hospital?**

**A:** No. The Scottish HSMR is not a measure of all in-hospital mortality because it does not include patients who die in hospital after 30 days from admission.

**Q: If a patient was transferred between hospitals and subsequently died, is this death attributed to the hospital the patient was initially admitted to or to the hospital the patient was discharged from/died in?**

**A:** The death is attributed to the hospital the patient was initially admitted to. While this introduces a limitation to the model, deaths have to be attributed to either the hospital of admission or the hospital of discharge/death – and neither option is perfect. The hospital of initial admission is chosen given the influence it has on care when deciding whether or not to refer. While such transfers account for only about 5% of all hospital-related deaths, transfer patients are a high risk group.

**Q: Are the data used to produce the HSMR 100% accurate?**

**A:** No, but that does not mean that the HSMR cannot be used intelligently. The accuracy of the HSMR is dependent on the accuracy of the SMR01 data that hospitals submit to PHI – and it is known that the information included in hospital discharge summaries (and subsequently recorded on SMR01) is not always as accurate or complete as would be liked. Each NHS board is responsible for the accuracy of the information it submits, and it is anticipated that one of the consequences of using the HSMR will be an improvement in the quality of the underlying data.

**Q: Does the HSMR take account of the provision of palliative care locally?**

A: No. Palliative care is not well recorded (on SMR01) and so the provision of palliative care services can be expected to influence the HSMR.

**Q: What should patients make of the HSMR?**

A: The HSMR cannot be used to make reliable judgements about the quality of patient care provided by hospitals. Patients are advised not to use HSMR for this purpose – as this may lead to inaccurate conclusions being drawn. However, patients could ask an NHS board how it is using the HSMR (and other data) to help improve the quality of care.

**Q: Can the HSMR be used to judge the quality of care or plan care for an individual patient?**

A: No. The HSMR is only valid when used for a group of patients, and it does not predict outcome for individual patients. As an example, it might seem surprising that there are deaths within a ‘low risk’ group, but if the expected mortality for a particular group of patients is 5% then even with good care, approximately 1 in 20 of those people will die.

## The role of different organisations

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In Scotland, there are a number of different organisations that have an important role to play in the production and use of the HSMR.

Each **NHS board and hospital** is responsible for the data it submits to Public Health & Intelligence that are used to produce the HSMR. This includes being responsible for the accuracy and the timeliness of its data. Each NHS board and hospital is also responsible for routinely reviewing its HSMR and acting upon this information to help improve patient care.

**Public Health & Intelligence (PHI)** is responsible for producing the HSMR for Scottish hospitals. This includes ensuring that the statistical model used to produce the HSMR is robust, and that the methods for analysing and presenting the data are appropriate. PHI is also responsible for supplying NHS boards with additional data and expert analytical advice to help them understand and interpret the HSMR.

**Healthcare Improvement Scotland** is responsible for working with NHS boards to provide authoritative advice on how to use the HSMR and reduce hospital mortality. It is also helping to develop a more co-ordinated and collaborative approach regarding the HSMR in Scotland, to ensure that this measure adds value to the health service. This includes the work of the **Scottish Patient Safety Programme**. Healthcare Improvement Scotland is also responsible for initiating and facilitating a structured dialogue with individual NHS boards and hospitals if they have a high or increasing HSMR.

The **Scottish Government** has a responsibility to be aware of, and where necessary act upon, national trends in the HSMR. If Healthcare Improvement Scotland has any serious concerns in relation to the HSMR for an individual hospital, then this can be escalated to Scottish Government.

## **Who to contact for further information and support**

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Within individual NHS boards and hospitals, there are improvement advisors who may be able to help with work locally on reducing hospital-related mortality.

Public Health & Intelligence can help with any statistical questions or requests for data. In the first instance, please contact:

**Robyn Munro (0131 275 6967 or [robyn.munro@nhs.net](mailto:robyn.munro@nhs.net))**

Healthcare Improvement Scotland can help with any questions about using the HSMR, including requests to be put in touch with another hospital doing work in this area. In the first instance, please contact:

**Donald Morrison (0131 623 4749 or [donald.morrison@nhs.net](mailto:donald.morrison@nhs.net))**



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The Healthcare Environment Inspectorate, the Scottish Health Council, the Scottish Health Technologies Group and the Scottish Intercollegiate Guidelines Network (SIGN) are part of our organisation.



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