Reducing In-hospital Mortality
Observations arising from AQuA's work
May 2013
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Introduction and background

We've taken it as a given that you want to provide high quality safe care for all your patients. We have seen much good practice in every Trust we have worked with, but when it comes to reducing in-hospital mortality, we can see that challenges still exist.

We know that there is no one single ‘magic bullet’ that will resolve all the issues you face but it’s increasingly clear that there are common improvement opportunities and themes. We can also see that having the right systems and processes in place to reduce in-hospital mortality needs to be linked to an understanding of the impact they will have. Do that and the benefits will be seen not only in relation to improvements in in-hospital mortality, but also more widely in overall quality of care.

We recognise that the actions that might be taken will differ by organisation. Therefore we have set out the areas that in our experience are most likely to make a difference as a set of questions for you to ask yourselves.

Whilst this is by no means an exhaustive list of actions that should or could be considered, it is based on a combination of the experience we have gained in undertaking our in-hospital mortality ‘deep dives’ and the learning and knowledge that we have acquired from our ‘reducing in-hospital mortality’ learning sets. It also reflects the advice we’ve received from other Quality and Public Observatories, the NHS Information Centre, Dr Foster Intelligence, CHKS and Professor Sir Brian Jarman, in addition to our own wider research.

Our work highlights that the construction of in-hospital mortality rates is complex. Therefore, we start with a quick guide to how in-hospital standardised mortality rates are calculated and a summary of the key differences between the different methodologies. We then share with you the issues we have found with the construction of the methodologies and the data that is used in the calculations.

Finally, we share what we have learnt in the course of our work about a range of wider considerations that we have found to be relevant to reducing in-hospital mortality rates.

The first sections of this document may seem like they are only relevant for a highly technical audience. However, understanding them is crucial and so we urge you to take the time to read and understand what we have found.

Whilst our work has been focused on providers in the North West of England, we believe it will be highly relevant to other parts of the country.

Therefore, our hope and expectation is that this report will not only give you insight into how to deliver a reduction in your in-hospital mortality, but it will also help to give you the confidence that the action you are about to take will have an impact.
Understanding mortality rates

In recent years, monitoring deaths in hospital has become a standard part of assessing the performance of our hospitals and the quality of their care. There are two ways to consider in-hospital mortality rates. It can be done by looking at either crude mortality rates or standardised mortality ratios (SMRs). Both measures are a valid measure of mortality and both are constructed from numbers of deaths. Together, they provide an indication that there may be a cause for concern, but do not definitively demonstrate that there is.

Mortality rates

Crude mortality rates (or crude death rates as they are sometimes called) divide the number of deaths that occurred within a given time period (the numerator) by the number of admissions or discharges during the same period of time (the denominator). It does not really matter whether admissions or discharges are used for the denominator. It does matter that the denominator and time period are used consistently if the data are used for comparative purposes. The number of deaths is sometimes referred to as the ‘actual number of deaths’. They can also be referred to as the ‘observed number of deaths’ or the ‘crude number of deaths’.

For in-hospital standardised mortality rates (SMRs), the number of deaths within a given time period is divided by the expected numbers of deaths. Expected deaths has a specific meaning in the context of SMRs. The term is used to provide an indication of how likely a patient was to die of the symptoms they had when they came into hospital.

It is not the same as avoidable or preventable in-hospital deaths, although the terms ‘expected’, ‘avoidable’ and ‘preventable’ are often used interchangeably. Avoidable deaths refer to deaths which occur where there are effective medical interventions available.

Avoidable deaths should therefore be rare and, ideally, should not occur. However, whilst some deaths are avoidable, it does not necessarily mean they are preventable.

The methodology used to calculate the expected number of in-hospital deaths is complex. It involves using a range of variables to ‘adjust’ or ‘standardise’ the data to reflect the risk (or likelihood) of death. These factors take into account things such as:

- Whether the patient was an emergency or an elective admission.
- Their age and gender.
- The diagnosis they were given when they were first admitted to hospital.
- Important co-morbidities the patient may have.
- Whether they are a palliative care patient.
- The relative affluence of the area where they live.

In contrast, crude mortality rates do not take into account these factors. For this reason crude rates are not appropriate for comparisons of organisations with different catchment areas as the cohort of people who are admitted to the hospital will have a different case-mix, age and gender profiles.

SMRs, on the other hand, can be used to provide more comparative analysis as the methodology used to calculate them allows for this. However, as you will see later, some of the limitations of the SMR approach mean that even here any comparisons must be treated with a great deal of caution.


2 Definition of Avoidable Mortality, ONS, 2011.
Finally, when considering in-hospital SMR calculations, we also refer to ‘excess in-hospital deaths’. The excess is taken to be the difference between the observed number of deaths and the expected number of deaths.

If the number is negative it implies that less people died in hospital than were expected. If it is positive it implies that more people died than were expected. The excess is sometimes referred to as a ‘higher than expected number of deaths’.

However, it is important to understand that ‘higher than expected’ or ‘excess’ in this sense is a statistical construct and it doesn’t refer to the chance of survival of individual patients.

It doesn’t measure how many deaths could have been prevented or how many might have been related to problems in care. The indicators can only prompt further investigation, they can’t tell us on their own whether there are problems with the quality of care in a particular hospital.

**SMR methodologies**

It is also important to understand the differences between the SMRs methodology and how they interpret the data used to calculate the SMR. The methodologies that are commonly used in the NHS are:

- Summary Hospital-level Mortality Indicator (SHMI) developed and published by the NHS Information Centre.
- Hospital Standardised Mortality Ratio (HMSR) developed and published by Dr Foster Intelligence.
- Risk Adjusted Mortality Index (RAMI) developed and published by CHKS.

A comparison of the SHMI, HMSR and RAMI is provided at Annex A. In the main they infer similar issues and concerns, but the differences that exist between the methodologies can lead to different results and potentially misleading conclusions being drawn.

Furthermore, the small differences that exist between individual organisations and between localities are not always adequately reflected in the calculation of each SMR and that this too can influence the expected number of deaths.

These differences include, but are not limited to:

- The weighting of the factors which are included in the calculation of the expected number of deaths.
- The list of inclusions and exclusions that are applied.
- The diagnosis chronology and cause of death.
- Data quality and coding depth of the data being used in the calculations.
Factors that influence the SMR

The SMRs were developed to make an assessment of the quality of care that a patient received during their stay in hospital. The logic used says if you were admitted with pneumonia but die of cardiac or renal failure then this is more likely to occur in a hospital with poorer standards of care than one with excellent standards of care.

However, whilst this is a great ambition, as you will see from the section that follows we are not sure that they accurately provide this information.

Diagnosis chronology

We continue to believe that SHMI, the HMSR and RAMI are credible statistical methodologies. We also continue to believe that, in the main, coders work hard to provide accurate and authentic interpretation of the clinical notes. It’s more that we can see that there appears to be a systematic misunderstanding between how morbidity and co-morbidity are coded in practice and how they are interpreted in the SHMI, HMSR and RAMI.

This may sound like statistical tautology, but it is a very important difference. In reality, the in-hospital SMRs are comparing information on how ill the hospital thought a patient was when they were admitted rather than on their actual cause of death.

For example, if a patient arrives at A&E and says they have a general pain in their chest then their first diagnosis in this episode of their care might well be recorded as ‘unspecific chest pain’. Let’s say that, after further investigation, their next diagnosis is angina but it later on it becomes apparent that they have had a pulmonary embolism (PE) and this then causes their death.

The data will record ‘unspecific chest pain’ as their first diagnosis and ‘angina’ as their second diagnosis. At some point the data will also record ‘pulmonary embolism’. The data will also record other information like their age and gender. In this example, the SHMI and the HMSR methodologies will assume that the patient died of unspecific chest pain (i.e. the signs and symptoms that they had when they first presented) not a PE entered on their death certificate.

Although the RAMI uses a different methodology which is based on the spell rather just the primary and secondary diagnosis, it too makes assumptions about how records are coded that could result in misinterpretation of the cause of death.

Therefore, it seems unlikely that any of the SMR methodologies will consistently and accurately reflect the true position with regard to areas of high in-hospital mortality concerns. In the main, they reflect ‘first diagnosis’ rather than cause of death.

We have not yet compared our findings to the data in the Registrar’s mortality database, which records the cause of death from death certificates, to the SMRs, but our recommendation is that work is urgently undertaken to do this.

If the Hospital Episodes Statistics (HES) codes were then used to provide information on how ill the patient was when the patient arrived at hospital (i.e. their co-morbidities) then, in combination, these two data sets would allow for a more accurate analysis of actual and expected in-hospital death rates. For this reason we’d support the view that, until the SMRs are calculated using the actual cause of death, they should not be used in isolation to draw conclusions about excess in-hospital mortality.
Factors that influence the SMR

Coding order

Furthermore, SMRs assume that all data is coded in line with the coding manual every time and that the chronology of the patient codes is the same in every case. However, in reality some patients will have lots of codes and some patients will have fewer codes depending on how they presented, where they presented and what they presented with.

For instance, it is likely that the coding applied to any pregnant woman who says at the door of the delivery suite that she is in labour will be coded in the same way at all maternity units in the country. However, it is less clear that the codes applied to, say, a patient who also complains of a chest pain will be the same in every single provider.

A patient who presents at A&E or a Medical Admissions Unit might expect to have a different first diagnosis than a patient who is admitted as a direct admission as a result of a visit to their GP, or from one who has been admitted directly from another provider.

A patient who presents to a small acute hospital on Wednesday lunchtime might have a different diagnosis journey than a patient who presents with the same set of signs and symptoms to a large teaching hospital on a Saturday night. Furthermore, it isn’t always obvious what’s wrong with a patient as soon as they enter a hospital, especially if they are an emergency admission.

As these examples illustrate, the sequence of the coding will be influenced by a range of factors that will be unique to the patient and the provider concerned. However, the SMRs assume that one size fits all and that cause of death will be identified as a result of the first or second diagnosis.

As a result it seems unlikely that the cause of death will always appear in a particular place in coding chronology, and the fact that it does not, may influence an organisation’s SMR and hence their ranking in comparison to their peers.

Use of signs and symptoms codes

Our work has also thrown up questions about how the ‘signs and symptoms’ codes are being aggregated in the construction of the expected mortality rates. These ‘signs and symptoms’ codes – or R codes as they are also known – are legitimate ICD10 code used to indicate that specific diagnoses have not yet been made.

An example of an R code is ‘unspecific chest pain’ that we’ve used in the text above, but many more of these unspecific codes exist and are used. This issue extends to more than just heart attacks and chest pain and is of direct relevance to a range of other clinical areas.

Where R codes occur in either the primary or secondary diagnosis, the SMR methodologies apply assumptions about the contribution these unspecific conditions made to a patient’s death. They do this by grouping similar R codes into a Clinical Classification System (CCS) group.

The CCS will be clinically relevant to the first and second diagnosis but the combination will determine the CCS group that is used. For instance, for a patient with a first diagnosis of ‘unspecified chest pain’ and a second diagnosis of ‘angina’ the CCS group will be ‘coronary atherosclerosis and other heart disease’. However, if the patient who was diagnosed with ‘unspecified chest pain’ subsequently died of a PE, their death will have been apportioned to an incorrect CCS group.

Therefore, where a Trust has a high number of deaths that have an R code as the primary diagnosis it follows that it could give a skewed picture of expected in-hospital mortality and this hence affect a Trust’s SMR.

Clearly, if as many as possible of the R codes were replaced nationally with a more accurate diagnosis, it is highly probable that it would change the profile of the expected number of deaths and hence change our view of those Trusts that appear to be an outlier. Therefore, it is important that Trusts address this.
Regional variation

A SHMI of greater than 1.00 infers a higher than expected death rate. The latest publication says that the overall SHMI for the North West of England is 1.07 and that 18 of 22 (82%) of the region’s providers have a SHMI greater than 1.00. Therefore, an element of our work has been to understanding why the North West differs from the rest of England.

It is fair to say that we don’t yet fully understand all the factors that are contributing to this variation. When we look at crude deaths (Figure 1) we can see that patients in the North West of England appear to die of similar causes to the rest of England.

Figure 1: Comparison of the 10 CCS groups with the highest in-hospital mortality rates based on crude rates in the North West of England with the rest of England.

<table>
<thead>
<tr>
<th>CCS group with the highest crude death rate</th>
<th>North West</th>
<th>Rest of England</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac arrest &amp; ventricular fibrillation</td>
<td>56.1%</td>
<td>54.2%</td>
</tr>
<tr>
<td>Aspiration pneumonitis; food/vomitus</td>
<td>46.3%</td>
<td>43.2%</td>
</tr>
<tr>
<td>Cancer of pancreas</td>
<td>33.0%</td>
<td>30.3%</td>
</tr>
<tr>
<td>Cancer of bronchus – lung</td>
<td>32.2%</td>
<td>27.8%</td>
</tr>
<tr>
<td>Respiratory failure; insufficiency; arrest (adult)</td>
<td>28.0%</td>
<td>28.7%</td>
</tr>
<tr>
<td>Septicaemia (except in labour) – Shock</td>
<td>27.2%</td>
<td>23.8%</td>
</tr>
<tr>
<td>Lung disease due to external agents</td>
<td></td>
<td>24.4%</td>
</tr>
<tr>
<td>Pneumonia (except that caused by tuberculosis or sexually transmitted disease)</td>
<td>23.0%</td>
<td>21.5%</td>
</tr>
<tr>
<td>Cancer of stomach</td>
<td>22.5%</td>
<td></td>
</tr>
<tr>
<td>Cancer of liver and intrahepatic bile duct</td>
<td>22.3%</td>
<td>21.0%</td>
</tr>
<tr>
<td>Acute &amp; unspecified renal failure</td>
<td>22.2%</td>
<td>20.3%</td>
</tr>
</tbody>
</table>

Notes

1 Data taken from the SHMI publication of data during the period Oct 2011 to Sep 2012. It includes deaths within 30 days of discharge. Crude rate is calculated by using observed deaths / admissions.

We know too that whilst deprivation might provide an explanation if were looking at mortality on a health economy or population basis, it does not provide a valid reason for a high in-hospital mortality rate. The methodologies used to calculate in-hospital SMRs either account directly for deprivation, as with the HSMR, or indirectly via levels of co-morbidities so that too does not explain why the North West differs from the rest of England.

We have also considered the possibility that the Advancing Quality programme might account for the high SHMIs in the North West providers. Advancing Quality operates in all North West providers in eight clinical focus areas (Annex F). The programme promotes adherence to a national and international body of clinical evidence underpinned by a philosophy that if you carry out this best practice there will be less deaths.
Therefore, our conclusion is that it is unlikely that the programme contributes to higher in-hospital deaths. However, we think it possible that because the introduction of Advancing Quality has resulted in better, and correct, identification of these patients on arrival at hospital – and that because of the assumption being made in the SMR methodologies that the first diagnosis is a proxy for cause of death – this may be contributing to the North West’s providers high SHMIs.

Without doubt the regional variation we can see underlines the need for further work to be carried out to better understand the reasons for these differences. It also underlines the importance of improving the clinical and coding systems and processes in a systematic way across England.

Local factors

We are also concerned that the SMRs are not sufficiently sensitive to account for valid local circumstances that might account for higher than expected in-hospital mortality. An example of this would be where in one part of the country a lot more people than the England average choose to die either at home, in a hospice or in a care or residential home. This will mean that not only will less people die in the local hospital, but also that the acuity of the patients being admitted will be different from other parts of the country. However, we are not convinced that the methodology will adequately take this into account. Potentially, this may adversely affect the SMR even though it’s aligned to good practice and is in accordance with patient wishes regarding place of death.

There’s a time lag

Finally, it’s also important to realise that there is a time lag between the cut off for the data and the publication date, and that the data used is based on rolling averages. For example, the October 2012 SHMI publication is based on in-hospital deaths that occurred between April 2011 to March 2012 and the January 2013 SHMI publication is based on in-hospital deaths that occurred between July 2011 to March 2012, as Figure 2 below shows.

The impact of the time lag means that any positive or negative changes in an organisation’s in-hospital mortality will only begin to be seen six months later and it will take 18 months for the full impact to be seen. The impact of the rolling averages means that any changes will be gradual. Although the HSMR and the RAMI are different, time lags also exist.

Figure 2: Timescales for inclusion of data for the SHMI

<table>
<thead>
<tr>
<th>SHM issue date</th>
<th>Data used in the SHMI calculations</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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<tr>
<td></td>
<td></td>
<td>Jan</td>
<td>Feb</td>
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<td>Jan-13</td>
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<td>Apr-13</td>
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<td>Jul-13</td>
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<td>Oct-13</td>
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<td>Apr-14</td>
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<td>Jul-14</td>
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Reducing In-hospital mortality

The factors that influence the quality of care

In delivering healthcare that is of the highest standard we know that it is important to focus on improvements across a range of systems and processes and to consider a range of external factors. We think it highly likely that all acute Trusts will be aware of many of the issues we raise. However, we also believe that whilst our list is quite long we doubt that this is an exhaustive resumé of all the actions that could be taken.

Whilst it is fair to say that we’ve yet to work with a Trust that has had to tackle every single point, we know that these issues are sufficiently common that they provide a reasonable checklist for lines of enquiry that could and should be considered in efforts to reduce in-hospital mortality.

We have structured these around our reducing in-hospital mortality programme driver diagram (which is replicated at Annex B).

This was developed as part of AQuA’s Reducing In-hospital Mortality Collaborative, which ran from April 2010 through to March 2011.

The main areas of focus (or primary drivers as they are referred to in the driver diagram in Annex B) are:

- Effective Clinical Care.
- End of Life Care.
- Documentation and Informatics.
- Leadership.
- Reliable care systems.

In each of the five primary driver sections we provide a summary of key lines of enquiry, and then go on to explain the rationale for our view.

At the end of each section we provide a list of the actions that we think may be helpful.
Effective clinical care

We know that clinicians aspire to provide the best possible care for patients

High quality clinical care means continually improving the quality of services in line with evidence-based best practice and safeguarding those high standards of care. However, it also has to consider aspects of efficiency and safety from the perspective of the individual patient and carers in the wider community. Education, training, transparency, risk management, audit and information are all important in these considerations.

Lines of enquiry that should be considered:

a) Have you prioritised your lines of enquiry to focus on the most common causes of in-hospital death? Do you undertake regular audit reviews of your medical records and do you undertake regular audit and peer reviews of records for patients who have died?

b) Are your improvement actions informed by, and aligned to, the current best clinical practice? Do you apply care bundles in a consistent way?

c) Are clinical escalation procedures the same across the organisation and do all clinicians understand the procedures?

d) Is continuity of care maintained at every stage in a patient’s stay? Do you use an effective clinical early warning system? Do you have a clinical outreach or rescue team?
**Effective clinical care**

### a) Understand the most common causes of in-hospital mortality

Leaving aside our issues about the construction of the SMR, our more general advice is for organisations to look first at the largest opportunities for improvement. In our experience these lie in the consideration of the following five areas:

- Those clinical conditions where there is the highest crude mortality rate.
- Those clinical conditions with the highest number of deaths.
- Those clinical conditions with the highest volume differences between observed and expected deaths.
- Those clinical areas where there are the highest number of deaths in conditions known as ‘deaths amenable to healthcare’ (i.e. where the evidence base is strong that the death should have been avoided). A list is provided at Annex G.
- Any death that was caused by one of the ‘never event’ conditions. The current list is replicated at Annex H.

It is also beneficial that a process of peer review of records for patients who have died is undertaken, and from this any common themes are recognised and actions put in place to address in future.

### OUR ADVICE IS TO:

- Look at improvement opportunities from a number of different perspectives. For example, what conditions do you have high levels of mortality in? What conditions have the largest gap between observed and expected deaths?
- Better understand where you differ from the average
- Peer review of records for patients who have died and learn from common themes

### b) Evidenced based care and adherence to care bundles

At its simplest, a clinical bundle is a list of evidence based processes pertaining to a particular condition. From a more advanced perspective, a clinical bundle describes the outcomes of a complex process that the health care system should bring to bear for each patient with a particular condition. The process of implementing and then auditing a bundle provides a consistent and evidence-based approach to improvement.

A good example of this is the North West’s Advancing Quality programme. This operates in eight clinical focus areas and works to ensure that any patient entering any North West provider with any of these conditions can expect to receive the same evidence based interventions where clinically appropriate.

However, the care bundle approach is also often applied in many other clinical focus areas and to many pathways of care on a local basis.

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3 http://www.advancingqualitynw.nhs.uk/index.php
The local and national CQUiN schemes, as well as local quality improvement strategies, are based on this concept.

However, in areas other than the Advancing Quality programme, our observation is that whilst these are based on good clinical practice, they are not necessarily applied to the same level of rigour across participating clinical focus areas within the same organisation. It suggests that more could be done to standardise mobilisation so that the variation in awareness, knowledge, understanding and application is reduced.

**OUR ADVICE IS TO:**

- For providers outside the North West to consider joining the Advancing Quality programme
- To review non-Advancing Quality care bundles to ensure they support and target key areas of risk/higher than expected mortality
- To monitor and audit compliance and effectiveness of care bundles

**c) Clinical escalation procedures and understanding**

Our advice is to make sure that there is clear guidance regarding a Trust’s early warning systems. This needs to be clearly and consistently communicated to staff.

The National Institute for Health and Care Excellence (NICE) has produced evidence which suggests that patients who are, or become, acutely unwell in hospital do not always receive optimal care. This may be because their deterioration is not recognised or, despite indications of clinical deterioration, it is not appreciated or acted upon quickly enough. NICE Clinical Guideline 50 advocates the use of physiological track and trigger systems to ensure early recognition of all patients with potential or established acute illness ensuring early appropriate treatment from appropriately skilled staff. The goal of using this system is to prevent harm and facilitate appropriate use of critical care resources through early recognition and treatment of the deteriorating patient.

Despite the publication of the NICE guidance that clearly sets out the actions that should be taken, in the course of our work we have found that sometimes clinical escalation processes appear to vary by site, specialty or team. This poses problems in ensuring timely care is provided to patients. It will have an effect on preventable mortality in as much as too late or inappropriate care may result in faster deterioration and potential death of those patients. We have also found that the understanding of escalation procedures varies from clinician to clinician, from team to team and from specialty to specialty. The variance appears to be highest in those Trusts that employ high numbers of locums.

**OUR ADVICE IS TO:**

- Look at and review escalation procedures and ensure these are commonly and consistently understood by clinical staff

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5 http://www.nice.org.uk/CG50
**d) Continuity of care**

Continuity of care appears to vary from patient to patient. The data given in Figure 3 below infers that some patients are seen by large numbers of different clinical teams during their stay in hospital. Whilst this may be necessary, it also has the potential to detrimentally affect their care and hence mortality rates.

**Figure 3: Non-elective episodes per spell**

![](image)

It is widely known that hand-overs and hand-offs are a key cause of unnecessary harm and so where a patient moves frequently from one clinical team to another (i.e. has multiple episodes of care) it is possible that this may contribute to inappropriate and untimely care.

The hand-over communication between units and between and amongst care teams might not include all the essential information, or information may be misunderstood. These gaps in communication can cause serious breakdowns in the continuity of care, inappropriate treatment, and potential harm to the patient.

We know from research that we have collated and captured in AQuA’s Safety Knowledge Store the safe transfer of care is a vital component of the quality of care and safe practice.

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When the process of transfer of care is inadequately undertaken, risks to the patient are increased and may subsequently lead to harm. For instance:

- A survey of trainees in the USA suggested that 15% of adverse events, errors or near misses involved hand-over.

- A review of root cause analysis suggests that in over 60% of errors, poor communication was an important causal factor.

- Breakdown in communication was the leading root cause of sentinel events reported to the Joint Commission in the United States of America between 1995 and 2006. Of the 25,000 to 30,000 preventable adverse events that led to permanent disability in Australia, 11% were due to communication issues.

- A recent survey by the Agency for Healthcare Research and Quality (AHRQ) on Patient Safety Culture, found that 42% of the hospitals surveyed reported that ‘things fall between the cracks when transferring patients from one unit to another’ and ‘problems often occur in the exchange of information across hospital units’.

Although we have no data on the number of harm events caused by hand-offs, we know that across the North West of England providers appear to have above average and increasing numbers of episodes per spell. Whilst this is a crude proxy measure it does suggest that patient pathways may benefit from review so that hand-offs between clinical specialties are minimised.

**OUR ADVICE IS TO:**

- Manage and review process for transitions of care
- Better understand human factor influence on reliability

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End of life care

A high quality end of life is just as important as a high quality life

Around 500,000 people die in England each year. This will rise to around 530,000 by 2030. Evidence suggests that some patients receive excellent end of life care, others do not. In 2007, the Healthcare Commission estimated that 54% of complaints in acute hospitals relate to care of the dying/bereavement care.

Therefore, an integrated approach to provision of services is key to the delivery of high-quality care to people approaching the end of life and their families and carers. End of life care services need to be commissioned from and coordinated across all relevant agencies and to include specialist palliative care.

Lines of enquiry that should be considered:

a) Are provision and procedures related to end of life standardised within your organisation and across the local health economy?

b) Are levels of quality and coverage in nursing and residential care home provision sufficient for local needs?

c) Have you considered the impact that the number of GPs in the local areas and their list size might have on admissions rates?

a) Provision and procedures related to end of life care

It is widely known that elements of care vary considerably from area to area, so understanding the position in each local area is important. The End of Life Care Strategy\(^\text{11}\) reported that people at the end of life frequently received care from a wide variety of teams and organisations and recognised the need to improve co-ordination of care. The development of Locality Registers (now known as Electronic Palliative Care Co-ordination Systems, or EPaCCS) was identified as a mechanism for enabling co-ordination. Such systems should allow for sharing of data items specified in the national information standard across a range of health and social care settings.

Furthermore, it’s also commonly accepted that there is major mis-match between people’s preferences for where they should die and their actual place of death.

Reducing In-hospital mortality

Although the number of people choosing to die in their usual place of residence is increasing (Figure 4), the default position for many terminally ill patients is admission to hospital. This results in:

- High levels of death in hospital.

- Consistently low levels of death in a person’s usual place of residence.

- Low levels of death in care homes.

In our experience, SMRs may be illustrative of challenges in accessing end of life care services, timeliness of managing patients at the end of their life and poorer quality of nursing, residential and out of hours care. If more people die in-hospital because of issues that exist in the community, then it follows that observed rates will be higher than expected rates.

Guidance from NICE\(^\text{12}\) on supportive and palliative care affirms the need to develop all aspects of services relating to care for patients nearing the end of life. The recommendations provide a framework. Despite this being aimed only at care for adult cancer patients, much is transferable beyond cancer and is of relevance to elderly care.

System-wide adherence to the Gold Standard Framework\(^\text{13}\) (Annex I) and the Liverpool Care Pathway\(^\text{14}\) are also important.

**OUR ADVICE IS TO:**

- Review provision and practices related to end of life patients, discussing wider health economy needs with local commissioners

- Consider jointly owned, pan-area, Electronic Palliative Care Co-ordination systems and the introduction of the Gold Standard Framework and the Liverpool Care Pathway for all end of life patients

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\(^\text{13}\) [www.goldstandardsframework.org.uk](http://www.goldstandardsframework.org.uk)

\(^\text{14}\) [http://www.mcpcil.org.uk/liverpool_care_pathway](http://www.mcpcil.org.uk/liverpool_care_pathway)
b) Provision of high quality nursing and residential care home

Nursing and residential care home provision will influence capacity and care in community settings. Where levels are low and capacity is short this may add pressure for patients to be admitted to hospital. If they are nearing, or at the end of their life, this may contribute to hospital mortality rates. However, skills and knowledge are also important. It is commonly known that they will send a patient to hospital with a relatively minor acute problem which could easily be addressed in the nursing home or residential care environment.

In the North West of England, the average level of nursing and residential bed provision is similar to the national average but this masks the variation that exists. Depending on the area there are between 5.5 and 13.3 beds per 1,000 list size. Nationally, the variation is 1.5 to 17 beds per 1,000 list size.

Figure 5: Care home provision

<table>
<thead>
<tr>
<th>Measure</th>
<th>North West</th>
<th>England</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care home beds / 1,000 list size</td>
<td>8.7</td>
<td>8.3</td>
</tr>
<tr>
<td>% social care beds</td>
<td>99.7%</td>
<td>99.6%</td>
</tr>
<tr>
<td>Care home beds: Treatment of disease, disorder or injury / 1000 list size</td>
<td>4.6</td>
<td>4.3</td>
</tr>
<tr>
<td>Care home service with nursing beds / 1000 list size</td>
<td>4.4</td>
<td>3.9</td>
</tr>
<tr>
<td>Care home service without nursing beds / 1000 list size</td>
<td>4.6</td>
<td>4.7</td>
</tr>
<tr>
<td>Accommodation for persons who require nursing or personal care beds / 1000 list size</td>
<td>8.6</td>
<td>8.2</td>
</tr>
<tr>
<td>Diagnostic and screening procedures beds / 1000 list size</td>
<td>3.8</td>
<td>3.8</td>
</tr>
<tr>
<td>Older people beds / 1000 list size</td>
<td>7.8</td>
<td>7.1</td>
</tr>
</tbody>
</table>

Our advice is to:

- Better understand admissions and re-admissions from and to nursing and residential homes
- Better understand patterns of admissions and re-admissions data by GP practice
Medical records and clinical coding

*Maintaining accurate patient records leads to improved clinical safety*

The primary use of information is to support high quality care. The most important source of information is the information held in health and care records. The information in records can help make sure health and care services join up efficiently and effectively with patients at their centre. Being able to access, add to and share health and care records electronically can help us take part in decisions about our own care.

**Lines of enquiry that should be considered:**

a) Are there any concerns about the accuracy of the clinical records?

b) Is data quality and record keeping excellent, and are the wider implications of less than excellent performance understood by coders and clinicians?

c) Is the usage of signs and symptoms codes reduced to a minimum?

d) Are the levels of co-morbidities considered to be correct when audited by external bodies?

e) Is palliative care coded correctly?
Medical records and clinical coding

a) Accurate record keeping and well maintained, quickly accessible medical records

Our work has highlighted that there are some common themes in relation to clinical records which warrant further investigation. These include:

• No discharge summary information or variable content of discharge summaries.
• How and where records are filed.
• Systems for getting case notes being inefficient and sometimes only available several days after admission.
• Notes being difficult to read.
• Notes are too large.
• Parts of notes are missing.
• Sometimes other people's notes are in the files.

These are perhaps found to some degree in most hospitals and illustrate the need for electronic patient records and a paperless NHS. Hard to find and incomplete information in records will influence the level of detail that coders can code to. Furthermore, we know that a standardised electronic discharge summary enables the continuous care of patients once they have been discharged from hospital, with consistent and relevant information in the right place, quickly.

In the longer term this will improve the information provided to patients and create a better way of patients and GPs working together in an informed manner. Conversely, lack of discharge summaries and slow and hard to find information puts patients at risk. It is important that you regularly audit your medical records to ensure they are managed, maintained and used appropriately.

b) Highest possible data completeness

Data quality and coding are often seen as 'easy answers' to why Trusts have higher than expected SMRs. Whilst in part this may be true, and there is need to acknowledge such data quality concerns, it is also vital that this does not divert attention from any clinical issues that may be contributing to higher levels of mortality.

Some of the Trusts we have worked with have shown increasing numbers of Secondary Uses Service (SUS) submissions. This may reflect increasing levels of activity and more complete recording. However, in these submissions there have been increasing levels of primary diagnosis errors.

Errors in primary diagnosis will affect Trusts’ observed and expected figures. Whilst coding is undertaken for morbidity, SMR methodologies use primary diagnosis to derive mortality rates.

If patients are allocated to an incorrect diagnosis this will affect which diagnosis group that patient maps to and so contribute to the variance between observed and expected. For the SHMI, where no definitive diagnosis can be identified, this data is bundled into a diagnosis group with low levels of expected mortality.

OUR ADVICE IS TO:

• Adopt best coding practices and check your data
• Consider and further develop Records Management Strategy, policy and procedures
• Further develop Records Management Strategy, policy and procedures
• Undertake regular audits of adherence to procedures, content of records, levels of missing records
c) **Minimising the use of the signs and symptoms codes**

Within the Trusts we have worked with there have been challenges with levels of signs and symptoms codes, coded through R codes. As discussed earlier in the document, this appears to have an adverse effect on standardised mortality rates. In our view taking steps to implement clinical decision-making aids in Emergency departments and having a senior opinion at the front door will be beneficial.

**OUR ADVICE IS TO:**

- Improve levels of definitive diagnoses
- Improve information awareness and strive for greater clinical ownership of the coding
**d) Levels of co-morbidities**

Across the North West of England, providers’ levels of co-morbidity per spell are higher than average and rising. This is, perhaps, not surprising due to deprivation and public health challenges in local health economies. However, whilst levels are higher than the England average they still may not accurately reflect the true case-mix of patients in care.

This has been evident in some of our work with providers. Following our support and their local action plans, they have revisited their data and coding and found levels of co-morbidities per spell that, in our view, suggests that they may have previously been under-coding.

*Figure 7: Diagnoses per spell*

![Graph showing diagnoses per spell: 2011/12](image)

**OUR ADVICE IS TO:**

- Measure and track levels of co-morbidities by division, specialty, consultant or similar
e) Palliative care coding

In some of the Trusts we have worked with there have been challenges related to identifying levels of palliative care need. At present, the various mortality ratios have different approaches to including palliative care patients. The level of palliative care coding is likely to affect a Trust’s HSMR but unlikely to affect its SHMI. The SHMI ignores palliative care coding and so will not identify patients likely to die under the care of a palliative care team.

The HSMR, on the other hand, accounts for deaths with palliative care coding, and so Trusts with low levels of palliative care may have higher SMRs. Although there is an ICD code (Z515) which is used to denote palliative care its use varies widely. The report Dying to Know\(^1\), (see footnote page four) estimated that between 1% and 60% of deaths may be coded as palliative care deaths which more reflects the use of the code than the proportion of patients who are terminally ill and likely to die in hospital. However, knowing this proportion locally will give you important contextual information. Organisations with high mortality and high level of palliative care coding would suggest a high mortality rate – but it does not follow that this is a consequence of poor quality hospital care.

Across the North West of England there are below average levels of palliative care coding at both specialty and diagnosis level. The aim should be to ensure that palliative care coding is accurate and that it properly reflects the numbers of patients receiving specialist end of life care. In AQuA's Reducing In-Hospital Mortality Collaborative, those hospitals with lower rates of palliative care coding tended to increase them, and those with high rates to reduce them, with the collaborative as a whole moving closer to the national average rate.

Figure 8: % deaths with palliative care coding at treatment specialty or diagnosis level

Our advice is to:

- Better understand the impact palliative care coding has on your SMRs and ensure accuracy of recording

Medical records and coding
Leadership

Excellent leadership is at the heart of reducing mortality

Improving the safety of hospital care and reducing hospital deaths provides a clear and well supported goal for clinicians, managers and patients. Delivery requires good leadership, good information, a quality improvement strategy based on good local evidence and a community-wide approach to improving the quality of processes of care. It also requires strong multi-disciplinary teams to lead quality improvement and to ensure the right spread of knowledge and experience. Studies of top teams in relation to quality, show significant positive relationships with measures of clinical involvement in continuous quality improvement and ‘total quality management’ approach to service delivery. They have the capacity and skills to project manage, collect and analyse data, and communicate and build trust with colleagues in the wider healthcare system.

Lines of enquiry that should be considered:

a) How aware are all managers and clinicians about in-hospital mortality rates? Do they have a good level of awareness and use of information relating to mortality across all areas of the organisation? Is in-hospital mortality just of interest for a few staff within the organisation or the concern of most?

b) Have you fostered an environment in which there is a continual dialogue between clinicians and coders and a shared and jointly owned understanding of clinical note taking and coding practice?

c) Do you learn from your mistakes in a way that ensures they don’t happen again?

d) Are roles, responsibilities and accountabilities clear in relation to the reporting of in-hospital mortality and for the subsequent delivery of action plans?

e) Have you looked at, and benchmarked, data on levels of clinical cover?

f) Do you undertake multiple approaches to the investigation and reporting of mortality?

g) Is the message, approach and understanding regarding in-hospital mortality clear and consistent at all stages from ‘Board to Ward’?

h) Are mortality rates considered in every consultant’s annual appraisal?
a) Using data to develop in-hospital mortality intelligence is everybody’s business

We’ve found variable use and understanding of the information that is available in organisations in relation to mortality and where and how to access it. For example:

• There have been different, and numerous, understandings of what Standardised Mortality Rates are, how they should be interpreted, and what remedial and improvement actions are possible.
• There has often been a focus on deaths rather than potential wider drivers and influences including the overall system of care.
• Variable understanding of the systems and processes that carried the most risk in terms of the causes of in-hospital mortality.
• Variable use of information on a routine basis to inform progress and support decision making.
• Variable use of information to understand specific areas and conditions.

All too often knowledge of SMRs is restricted to informatics staff and interested clinicians only. This poses challenges in ownership and knowledge due to the multi-factorial drivers of high mortality. Clinicians and managers at all levels need to make better use of the information they have and move towards collecting and using information based on outcomes and quality.

They need to embrace a culture change, promoting staff education about in-hospital mortality to transform the way that services are delivered. Addressing the cultural and behavioural change needed to make best use of information and IT and to support new ways of working will take time and strong leadership. No strategy in itself can address the issues of cultural and behavioural change, but education (in the broadest sense), training and development coupled with effective leadership are crucial to make this happen.

b) There needs to be a continual dialogue between clinician and coders

There are often good relationships between clinicians and coders. However, there is always more that can be done, especially for those clinicians and managers who are less engaged. Good leadership implies:

• Encouraging clinicians and coders to understand the implications of how data and information is captured and subsequently reported.
• Supporting clinicians and coders to have an effective working relationship.
• Make sure you invest in coders’ professional development.

Our advice is to:

• Regularly review hospital performance, your HSMR, crude mortality rates and diagnosis specific rates as part of a package of general quality improvement measures
• Focus information and intelligence to where and who needs it

• Review the system for monitoring mortality ensuring the correct people are involved, receiving and understanding the information
c) Be a learning organisation

Root cause analysis (RCA) is a structured method used to analyse serious adverse events. Initially developed to analyse industrial accidents, RCA is now widely deployed as an error analysis tool in health care. A central tenet of RCA is to identify underlying problems that increase the likelihood of errors, while avoiding the trap of focusing on mistakes by individuals. The goal of RCA is to identify both:

- Active errors (errors occurring at the point of interface between humans and a complex system).
- Latent errors (the hidden problems within health care systems that contribute to adverse events).

RCAs should generally follow a pre-specified protocol that begins with data collection and reconstruction of the event in question through record review and participant interviews. A multi-disciplinary team should then analyse the sequence of events leading to the error, with the goals of identifying how the event occurred (through identification of active errors) and why the event occurred (through systematic identification and analysis of latent errors). The ultimate goal of RCA, of course, is to prevent future harm by eliminating the latent errors that so often underlie adverse events.

RCA is a widely used tool but isn’t a panacea to reliable care issues. As illustrated by the so called ‘Swiss cheese model’, multiple errors and system flaws must often intersect for a critical incident to reach the patient. Labelling one or even several of these factors as ‘causes’ may place undue emphasis on specific ‘holes in the cheese’ and obscure the overall relationships between different layers and other aspects of system design. As a result, some have suggested replacing the term ‘root cause analysis’ with ‘systems analysis’.

RCA is one of the most widely used approaches to improving patient safety but, perhaps surprisingly, there is little data to support its effectiveness. Much of the problem lies in how RCAs are interpreted rather than in how they are performed, since there is no consensus on how hospitals should follow up or analyse RCA data. This limits the utility of RCA as a quality improvement tool. Another issue is that few formal mechanisms exist for analysis of multiple RCAs across institutions. As an individual RCA is essentially a case study of a specific error, analysis of multiple RCAs performed at different institutions may help identify patterns of error and point the way toward solutions.

OUR ADVICE IS TO:

- Understand common themes and share lessons learned and solutions
- Understand wider potential drivers. These will potentially differ by site, and/or condition

d) Ensure the Board fulfils its proper role

Board practices found to be associated with better performance in both process of care and mortality include:

- Having a Board quality committee with clear Terms of Reference that include mortality monitoring, even if the rate is below the expected.
- The establishment of a hospital mortality reduction group with senior leadership and support to ensure the alignment of the hospital departments helps to achieve the common goal of reducing in-hospital mortality.
- Establishing strategic goals for quality improvement.
- Being involved in setting the quality agenda for the hospital.
- Including a specific item on quality in Board meetings.
• Using a mortality dashboard which uses the data from the mortality database on the actual cause of death which is regularly reviewed and considered alongside national benchmarks that includes indicators for clinical quality, patient safety, and patient satisfaction.
• Linking senior executives’ performance evaluation to quality and patient safety indicators.
• Training and awareness in processes of high quality care such as clinical observation, medication safety and infection control.

**OUR ADVICE IS TO:**

- Develop clear strategic objectives with regard to reducing in-hospital mortality
- Review mediums for communicating clear and consistent messages to staff
- Review existing governance arrangements to ensure these are aligned and do not duplicate activities and responsibilities of other groups

**OUR ADVICE IS TO:**

- Make quality and safety paramount to an organisation and review the way the Board exercises leadership on these issues

**OUR ADVICE IS TO:**

- Include mortality in consultant appraisals

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**e) Have a consistent message, approach and understanding from ‘Board to Ward’**

Our work to date we has provided examples of unclear and inconsistent communications. These issues have been complicated further by multiple layers of governance, with limited alignment and different reporting arrangements. Ways of working were sometimes different across sites and departments. Cross-working between corporate and clinical directorates has been variable. In this there were wide ranges of understanding in terms of what processes were in place for monitoring and reviewing mortality and how these fit into an organisation’s wider quality agenda.

These may well be common issues to any large multi-site, multi-profession organisation. However, they do point to improvement opportunities that would indirectly improve quality of care and mortality in an organisation.

**f) Include mortality rates in the consultant annual appraisal**

Mortality is not a mandatory part of a consultant’s annual appraisal, nor does it form part of revalidation. Although there is a requirement for quality improvement to be considered and for audit data to be included, at no point does the guidance mandate that the impact on mortality rates should feature as an outcome indicator. However, our local discussion with clinical leads has pointed to a general consensus that it should be and the benefits of including it would be allowing greater focus and ownership by clinicians. Although there are national plans to publish consultant level outcomes information, it is also possible that information governance rules will disallow the comparison of mortality rates in most cases.
Reliable care systems

Providing reliability ensures a healthy system for all

One million people use the NHS each day and while the majority of people are treated without incident. However, it is estimated that one in 10 people admitted to hospital in the UK will experience some sort of harm during their stay. Many of these will go unrecognised. In nearly every case the problem is caused by unreliable healthcare systems and processes.

People need to be sure they will receive the same high standard of care and safety whichever part of the NHS they access, but we also recognise that healthcare is a high hazard industry. The practice of medicine involves complex systems in which people play a key role.

Procedures are very technical and sometimes risky and the potential for error and system failure is always there. Adverse things happen on a regular basis: staff are on sick leave, equipment doesn’t work, people forget to do something; we are all human no matter how diligent.

Reliability principles are used successfully in other high hazard industries, such as manufacturing and air travel, to help evaluate, calculate and improve the overall reliability of complex systems. Lessons from these industries can be used to design systems that compensate for the limits of human ability. They can improve safety and the rate at which a system consistently produces the desired outcomes.

Lines of enquiry that should be considered:

a) Are staffing levels adequate and is the skill mix appropriate, especially at night and at weekends?

b) Do you regularly monitor staffing levels and assess the impact of these levels on adverse events?

c) Is staff satisfaction high?

d) Are key decision makers in a place where they can make key decisions?

e) Are the governance arrangements for quality and in-hospital mortality joined up and mainstreamed into everyday business?

f) Are approaches to quality, performance and mortality joined up and cohesive?
a) **Review staffing levels**

An association between nursing staffing levels, higher quality and lower morality has been reported in several studies\(^\text{16}\). The statistical relationship between clinical cover and mortality rate infers that the lower a Trust’s numbers of doctors and nurses per bed the higher the mortality rate. This measure is not without controversy and it is fair to say that it is a crude indicator of clinical cover, due to the nature of the data, and there are many factors that would provide a plausible explanation for this.

For instance, we know that below average levels of doctors and nurses per bed, when taken in the context of the wider local health economy, may be a sign of things such as lower levels of clinical cover, through to over provision of beds in the wider health economy. Therefore, our view is that a high (or low) rate may indicate an issue with staffing levels or with skill-mix. Therefore our recommendation is that any provider in this position should undertake a more detailed workforce assessment based on more robust local intelligence.

**Figure 9: Staff to bed ratios**

![Graph showing staff to bed ratios for doctors and nurses from 2008/9 to 2011/12 in the Northwest, England, and a linear trend]

**OUR ADVICE IS TO:**

- Look at staffing levels and skill-mix
- Ideally, track levels of safe staffing on wards and include this alongside other indicators such as mortality, incidents and similar to gauge whether staffing levels are contributing to wider quality

\(^{16}\) [http://www.ahrq.gov/research/findings/factsheets/services/nursestaffing/nursestaff.pdf](http://www.ahrq.gov/research/findings/factsheets/services/nursestaffing/nursestaff.pdf)
b) **Take steps to improve low morale**

A recent study by Dr Richard Pinder\(^{17}\) and colleagues at Imperial College, London found that hospitals in England with lower mortality rates were more likely to have members of staff satisfied with the quality of care they provide. Their research suggests that satisfaction levels among non-clinical staff were closely tied to a hospital’s performance as those of doctors. A stronger correlation was found among nursing staff. The research team determined levels of satisfaction by examining data from the NHS’s 2009 staff survey. They focused on whether or not staff would recommend their NHS Trust to a friend or colleague, whether they felt that care was their Trust’s priority, and if they were themselves happy with the standard of care they provided to patients. These results were then compared with the individual Hospital Standardised Mortality Ratios (HSMRs).

The authors acknowledge that further research is required to establish the mechanism behind the correlation but their work does demonstrate that staff satisfaction is correlated with organisational performance.

The findings suggest that staff satisfaction could be used as an early warning system to help spot more serious institutional failings. Regular surveys asking questions such as ‘would you recommend this hospital to friends and family?’ might have been able to prevent the deterioration of hospital standards that occurred at the Mid Staffordshire NHS Foundation Trust.

At AQuA we also believe that absence rates, staff stability and clinical cover are also important. For instance, we know that higher absence rates alongside lower clinical cover may create challenges providing appropriate and timely care, and that this may consequently have a negative effect on an organisation’s mortality rate.


\(^{18}\) [http://www.aomrc.org.uk/](http://www.aomrc.org.uk/)

c) **Minimise the risk – put key decision makers in a place where they can make key decisions**

There is a growing body of evidence to suggest that where there is a lack of access to clinical services over a seven day period, patients do not always experience parity of access to the optimum treatment or diagnostic tests. This can result in delays to their treatment that can contribute to less favourable clinical outcomes. Improving access for patients both out of traditional 8am to 6pm, Monday to Friday services and also across the weekend period, results in fewer delays in healthcare delivery.

Furthermore, there is also a view that high quality care is best provided when a senior clinical opinion is available 24 hours a day, seven days a week. This allows for more rapid assessment, diagnosis, care planning and discharge of patients.

For some time, the Academy of Medical Royal Colleges (AOMRC)\(^{18}\) has highlighted the benefits of consultant delivered care, to make more efficient use of resources and improve outcomes for patients.
It has been proposed that the advantages of consultant delivered care should be available to all patients regardless of the hour of the day or day of the week.

Furthermore, in 2011, the Dr Foster Hospital Guide\(^9\) stated that:
‘Your chances of surviving hospital treatment depend not just on where you are treated but also when. Patients admitted as an emergency at weekends are significantly more likely to die. The hospitals with the fewest senior doctors available at weekends have the highest mortality rates.’

This is concerning for the general public as people cannot choose when they fall ill and should not have to accept a compromised level of care outside of standard working hours.

**Our advice is to:**
- Increase 24/7 consultant cover
- Review mortality time series in relation to skill-mix / department opening hours/other local factors
- Consider how best to ensure rapid access to senior clinical decision makers

\(^d\) **Be mindful of the ‘soft’ intelligence**

SMRs are highly complex and are driven by many factors and so need considering alongside other things. Whilst analysis of SMRs offers a ‘smoke alarm’ alert for Trusts which gives the opportunity to look into potential issues, there are alternative ways of looking at the detail and identifying areas of concern and risk.

In our work with members, we have seen evidence of organisations focussing solely on observed deaths, and focusing purely on standardised rates, but not considering wider factors such as staffing levels, data quality, incident reporting etc.

SMRs can identify risk relative to a hypothetical ‘population’. However, contingency and action planning can only ever be based on actual activity. Therefore, it is important to have a wider perspective and to understand indicators are just that, i.e. indicators. Improvement requires well-rounded discussion and analysis. Indicators, on their own, are not the solution.

Our view is that a combination of adverse performance in a wider range of indicators should always be considered and that no one indicator can provide a rounded picture on quality. High-quality care can be defined in three parts: clinical effectiveness, safety, and patient experience.

We’ve listed a few sources of intelligence that we believe are key to understanding the consequences of poor clinical care. They should be used to supplement SMRs to provide a more rounded picture of the quality and safety of services provided.

Reducing In-hospital mortality

**d) Be mindful of the ‘soft’ intelligence** (continued)

Figure 10: Sources of intelligence that might be used to provides a wider view on in-hospital mortality concerns

<table>
<thead>
<tr>
<th>Source of Intelligence</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient satisfaction</td>
<td>A strong body of evidence exists to support the view that patient experience is positively associated with clinical effectiveness and patient safety, and should be included as one of the central pillars of quality in healthcare.</td>
</tr>
<tr>
<td>Staff satisfaction</td>
<td>A strong body of evidence exists that links low morale with poor performance. Although the national staff satisfaction survey is a crude measure of morale, it does provide an indication of organisations that have issues that might adversely affect the care they provide.</td>
</tr>
<tr>
<td>Complaints</td>
<td>A high number of serious complaints are always a cause for concern. The findings of the review into the failings at the Mid Staffordshire NHS Foundation Trust suggest that information relating to the severity of complaints, the volume of complaints on similar themes as well as the number of complaints upheld by the Ombudsman provide important intelligence about the quality of care being provided.</td>
</tr>
<tr>
<td>Serious untoward incidents</td>
<td>An organisation that doesn’t appear to learn from errors is always a cause for concern. Analysis of the trends in similar serious untoward incidents will provide useful intelligence.</td>
</tr>
<tr>
<td>Hospital acquired infections</td>
<td>High levels of hospital acquired infection are an indicator of poor systems and processes and of a lack of attention to the basics of care.</td>
</tr>
<tr>
<td>Reporting of harm</td>
<td>The number of all harm events reported gives an indication of the culture of the organisation. The most open and transparent organisations will have high levels of reporting.</td>
</tr>
<tr>
<td>Bed occupancy</td>
<td>This measure gives you an indication of how the organisation is run and the day to day pressure it is under. Whilst a low figure won’t tell you whether it is good or bad, a high figure generally indicates a cause for concern both in terms of running an effective organisation and patient experience.</td>
</tr>
<tr>
<td>Cancelled operations</td>
<td>Whilst a low figure won’t tell you whether it is good or bad a high figure always indicates a cause for concern.</td>
</tr>
<tr>
<td>Delayed transfers of care</td>
<td>Whilst a low figure won’t tell you whether it is good or bad a high figure always indicates a cause for concern. High delays in the transfers of care is likely to mean that patients spending longer than they should in hospital and may mean that they are not being seen by the right clinical staff for their particular health needs.</td>
</tr>
<tr>
<td>Capital spend over time</td>
<td>Historically low levels of capital investment results in a poor estate and is likely to indicate a tight financial position. Both of these factors link to the patient experience.</td>
</tr>
</tbody>
</table>

**OUR ADVICE IS TO:**

- Review a range of relevant data, not just SMRs

20 http://bmjopen.bmj.com/content/3/1/e001570.abstract
In conclusion

SMRs have generated considerable public interest and we hope that this report adds a further dimension to this debate. Our view remains that SMRs are useful and we recognise that they are important when assessing the quality of care that is provided.

However, as you will see from the advice we provide in this report, they have their limitations and should not be used as a sole indicator of patient and quality safety. To consider SMRs in isolation of other factors could potentially give a misleading interpretation of a hospital’s safety and quality record.

The insights from SMRs should always be used with other relevant indicators as a tool to support improvement in the quality of care. Indeed, within any provider organisation, changes to the crude death rate over time remains an important indicator just as the SMR remains an important piece of intelligence when comparing in-hospital mortality between providers.

As the findings of the Inquiry into the care provided at the Mid Staffordshire NHS Foundation Trust\(^21\) show a range of indicators which include the frequency and severity of complaints, staff morale and patient satisfaction are also very important.

We hope the information we have presented will help you to look closely at the factors that influence your in-hospital SMR. In our view, because of this complexity, it is almost impossible to change the data that is used to calculate SMRs and be assured, with any degree of certainty, of achieving a pre-determined ranking or result.

Therefore, whilst understanding how the different methodologies affect your standardised mortality rates is an important part of the overall reducing in-hospital mortality journey, it may still mean that you might work hard to address a particular area of concern – and improve patient care as a result - but it could have had limited or no impact on the overall SMR.

\(^{21}\) [http://www.midstaffsinquiry.com/pressrelease.html]
Effective clinical care

- Have you prioritised your lines of enquiry to focus on the most common causes of in-hospital death?
- Do you undertake regular audit reviews of your medical records and do you undertake regular audit and peer reviews of records for patients who have died?
- Are your improvement actions informed by, and aligned to, the current best clinical practice? Do you apply care bundles in a consistent way?
- Are clinical escalation procedures the same across the organisation and do all clinicians understand the procedures?
- Is continuity of care maintained at every stage in a patient’s stay? Do you use an effective clinical early warning system? Do you have a clinical outreach or rescue team?

End of life care

- Are provision and procedures related to end of life standardised within your organisation and across the local health economy?
- Are levels of quality and coverage in nursing and residential care home provision sufficient for local needs?
- Have you considered the impact that the number of GPs in the local areas and their list size might have on admissions rates?

Medical records and clinical coding

- Are there any concerns about the accuracy of the clinical records?
- Is data quality and record keeping excellent and are the wider implications of less than excellent performance understood by coders and clinicians?
- Is the usage of signs and symptoms codes reduced to a minimum?
- Are the levels of co-morbidities considered to be correct when audited by external bodies?
- Is palliative care coded correctly?

Leadership

- How aware are all managers and clinicians about in-hospital mortality rates? Is their level of awareness and use of information relating to mortality high across all areas of the organisation? Is in-hospital mortality just of interest for a few staff within the organisation or the concern of most?
- Have you fostered an environment in which there is a continual dialogue between clinicians and coders and a shared and jointly owned understanding of clinical note taking and coding practice?
- Do you learn from your mistakes in a way that ensures they don't happen again?
- Are roles, responsibilities and accountabilities clear in relation to the reporting of in-hospital mortality and for the subsequent delivery of action plans?
- Have you looked at, and benchmarked, data on levels of clinical cover?
- Do you undertake multiple approaches to the investigation and reporting of mortality?
- Is the message, approach and understanding, regarding in-hospital mortality clear and consistent at all stages from ‘Board to Ward’?
- Are mortality rates considered in every consultant’s annual appraisal?

Reliable care

- Are staffing levels adequate and skill mix appropriate especially at night and at weekends?
- Do you regularly monitor staffing levels and assess the impact of these levels on adverse events?
- Is staff satisfaction high?
- Are key decision makers in a place where they can make key decisions?
- Are the governance arrangements for quality and in-hospital mortality joined up and mainstreamed into everyday business?
- Are approaches to quality, performance and mortality joined up and cohesive?
Appendices
## Annex A: Differences between SHMI, HSMR and RAMI

<table>
<thead>
<tr>
<th></th>
<th>Summary Hospital-level Mortality Indicator (SHMI) **</th>
<th>Hospital Standardised Mortality Rate (HSMR)</th>
<th>Risk Adjusted Mortality Index (RAMI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Observed</strong></td>
<td>Number of observed in-hospital deaths plus deaths out of hospital within 30 days of discharge</td>
<td>All spells culminating in death at the end of the patient pathway, defined by specific diagnosis codes for the primary diagnosis of the spell: uses 56 diagnosis groups which contribute to approx. 80% of in hospital deaths in England*</td>
<td>Total number of observed in-hospital deaths</td>
</tr>
<tr>
<td><strong>Expected</strong></td>
<td>Expected number of deaths Calculated using a 36-month data set to get the risk estimate</td>
<td>Expected number of deaths Calculated using a 10-year data set (as of 2012) to get the risk estimate</td>
<td></td>
</tr>
<tr>
<td><strong>Adjustments</strong></td>
<td>• Gender • Age group • Admission method • Co-morbidity • Year of dataset • Diagnosis group Details of the categories can be referenced from the methodology specification document***</td>
<td>• Gender • Age in bands of five up to 90+ • Admission method • Source of admission • History of previous emergency admissions in last 12 months • Month of admission • Socio economic deprivation quintile (using Carstairs) • Primary diagnosis based on the clinical classification system • Diagnosis sub-group • Co-morbidities based on Charlson score • Palliative care • Year of discharge</td>
<td>• Gender • Age group • Clinical grouping (HRG) • Primary and secondary diagnosis • Primary and secondary Procedures • Hospital type • Admission method Further detailed methodology information is included in CHKS products****</td>
</tr>
<tr>
<td><strong>Exclusions</strong></td>
<td>• Specialist, community, mental health and independent sector hospitals. • Stillbirths • Day cases, regular day and night attenders</td>
<td>Excludes day cases and regular attendees</td>
<td>Excludes mental illness, obstetrics, babies born in or out of hospital, day cases, and patients admitted as emergencies with a zero length of stay discharged alive and spells coded as palliative care (Z515)</td>
</tr>
<tr>
<td><strong>Whose data is being compared and how much data is used for comparison e.g. all Trusts or certain proportion etc.</strong></td>
<td>All England non-specialist acute trusts except mental health, community and independent sector hospitals. Data attributed to Trust in which patient died or was discharged from</td>
<td>All England provider Trusts via SUS Data attributed to all Trusts within a ‘super-spell’ of activity that ends in death</td>
<td>UK database of Trust data and HES Data attributed to Trust in which patient died</td>
</tr>
</tbody>
</table>

* HSMR does not exclude 20% of deaths, it looks for the diagnosis groups that account for the majority of deaths, and the figure of 80% is quite variable dependent on the case mix of the trust. HSMR could just as easily cover 100% of activity. It covers 80% of activity mostly for historical reasons and the fact that you get little extra value from the other 20%.

** The HSCIC publishes the SHMI indicator as observed, expected, denominator, value, upper control limits, lower control limits and banding. The term numerator is not used in the publication.


**** CHKS [www.chks.co.uk](http://www.chks.co.uk)
Annex B: Reducing in-hospital mortality programme driver diagram

<table>
<thead>
<tr>
<th>AIM</th>
<th>PRIMARY DRIVERS</th>
<th>SECONDARY DRIVERS</th>
</tr>
</thead>
</table>
| By 1 April 2014 all North West AQuA members will have improved their adjusted mortality raters to 1 (or less) as SHMI | Clinical Care  
Provide safe, evidence-based care by implementing care bundles/patient pathways | • Implement evidence-based care for our leading causes of death  
• Implement/continue strategy to reduce patient harm  
• Understand/agree infrastructure priorities that pose barriers to evidence-based care (OOH care, vacancies, clinical leadership etc) and develop a plan to prioritise/address them  

End of Life Care  
Provide patients an excellent experience at the end of life in a setting of their choosing |  | • Improve opportunities for people to die in their preferred place  
• Ensure patients in the hospital are reviewed for ceiling of care and placed on LCP when appropriate  

Documentation & Informatics  
Patient documentation and coding is accurate, includes all relevant clinical information and is used effectively to improve care |  | • Staff have sufficient skills in utilising standardised mortality data  
• Hospitals measure/improve completeness of co-morbidity coding  
• Implement accurate documentation of first episode of care  
• Policies, training and forms enable complete/accurate documentation and coding  
• Regular, real-time monitoring of data completeness and accuracy takes place and is reported up as a system measure  

Leadership  
The organisation has the date, reporting and leadership skills it needs to manage and improve standardised mortality |  | • Leaders know everything they need to about the organisation’s standardised mortality data  
• Clinicians take responsibility for processes and outcomes  
• Board meeting agendas include useful mortality information and the Board makes decisions based on this information  
• Leaders prioritise organisation efforts to reduce mortality  

Reliable Care Systems  
Organisations reliably develop, improve and use reliable systems of care |  | • Organisations consider all elements of a 24/7 service  
• Organisations reliably report and act upon never events  
• Organisations implement and sustain robust escalation/EWS/mortality monitoring systems |
Annex C: In-hospital mortality deep dive approach

Trust

- Desktop review
- Interviews
- Qualitative analysis
- Quantitative analysis

Data and information findings

- Wider Quality of Care findings

- Report

- Presentation to the Trust

Action plan development and support
Annex D: Useful resources and wider reference

- Academy of Medical Royal Colleges, Seven Day Consultant Present Care, http://www.aomrc.org.uk/publications/statements/doc_details/9532-seven-day-consultant-present-care.html
- The NHS Confederation, FAQs for Boards: http://www.nhsconfed.org/priorities/Quality/Pages/Summary-Hospital-level-Mortality-Indicator.aspx
- Academic research, (published by BMJ 2012) Preventable deaths due to problems in care in English acute hospitals: a retrospective case record review study, http://qualitysafety.bmj.com/content/early/2012/07/06/bmjqs-2012-001159.full
- The NHS Information Centre, Standardised Hospital Mortality Index information and data: https://indicators.ic.nhs.uk/webview/
Annex E: About AQuA

The Advancing Quality Alliance (AQuA) is a health care quality improvement body.

AQuA operates on a not-for-profit basis and is funded by subscriptions from NHS healthcare organisations. Formed in recognition that improvement has to be led from the front-line rather than be centrally imposed, AQuA’s aim is to accelerate the pace of improvement and to help good practice to spread rapidly.

The ethos of AQuA is to stimulate, share and support improvements and innovations in the quality of services delivered to patients and their families.

We have organised our work under the five Domain headings of the NHS Outcomes Framework and these are supported by:

- **AQuA Analytics** provides sources of intelligence to stimulate innovation and supports delivery;

- **AQuA Academy** builds capacity and capability across the AQuA membership in improvement methods and in change management;

- **AQuA Action** spreads best practice and opportunities for collaborative learning across organisations and across sectors;

- **AQuA Partnerships** provide our membership with a direct link to the best UK and international expertise.

Of course, from the patients’ perspective these Domains don’t operate in isolation and we know that we need to make the right linkages between them if we are going to achieve transformational improvement.

AQuA’s continuing work to support integration helps make these connections at the frontline of service delivery.

AQuA’s work has already led to quantified quality improvements across the North West of England. Our Reducing Mortality Collaborative worked with nine Trusts with high Hospital Standardised Mortality Rates.

The learning from this work was rolled out to all AQuA members in 2011.
Annex F: Advancing Quality

Advancing Quality (AQ) is a clinically-led quality improvement programme designed to drive up standards in healthcare, reduce variation and reduce avoidable mortality.

As the flagship programme of AQuA (Advancing Quality Alliance), AQ is well-established, funded by all North West Clinical Commissioning Groups (CCGs) and ‘live’ in every NHS acute and mental health provider trust in the region since 2008.

Operating in eight specific clinical areas, the AQ quality indicators aim to ensure every patient receives the same high standard of care in every hospital by focusing on adherence to key evidence based clinical interventions, patient experience and patient and clinical outcomes.

These standardised quality measures are the basis of the AQ programme, which is running in 34 provider trusts across the North West of England, and provide a benchmark for commissioners to measure quality and understand variation across the region.

The eight clinical conditions are:
- Heart Failure
- Coronary Artery Bypass Graft (CABG)
- Acute Myocardial Infarction (AMI)
- Hip and Knee replacement surgery
- Pneumonia
- Stroke
- Dementia
- First Episode Psychosis

And it works. In a paper published in the New England Journal of Medicine, a team of independent health experts and economists led by the University of Manchester concluded AQ was associated with 890 fewer deaths in just the first 18 months alone. Providing a focus for the whole health economy, AQ is more than a passing fad. The first four years of AQ have shown:

- AQ is a proven methodology and cost effective way to drive improvement,
- It is a valuable vehicle for describing what quality looks like,
- It can be used to deliver CQUiNs which are targeted and linked to improved outcomes,
- It is clinically-led, with standardisation and collaboration at its core,
- It is aligned to national and local priorities and other quality initiatives, e.g. NICE standards, national audits etc.

Work is now being carried out to extend the AQ programme further into Chronic Obstructive Pulmonary Disease (COPD) in primary and community care in alignment with the AQuA goals and objectives.

The programme measures quality across three dimensions:
- Clinical Process and Outcome Measures
- Patient Reported Outcome Measures (PROMs)
- Patient Experience Measures (PEMs)

The results are made public annually and allow patients to evaluate the performance of a trust. This can then be a factor in their decision making when considering where to be treated.

For more information about Advancing Quality, go to www.advancingqualitynw.nhs.uk

Annex G: Mortality from causes considered amenable to health care

Deaths considered amenable to health care\textsuperscript{23} are defined as those from the following causes for the specific age groups stated.

**Infections**
- Tuberculosis, A15–A19, B90, 0–74 years
- Selected invasive bacterial and protozoal infections, A38–A41, A46, A48.1, B50–B54, G00, G03, J02, L03, 0–74 years
- Hepatitis C, B17.1, B18.2, 0–74 years
- HIV/AIDS, B20-B24, All years

**Neoplasms**
- Malignant neoplasm of colon and rectum, C18–C21, 0–74 years
- Malignant melanoma of skin, C43, 0–74 years
- Malignant neoplasm of breast, C50, 0–74 years
- Malignant neoplasm of cervix uteri, C53, 0–74 years
- Malignant neoplasm of bladder, C67, 0–74 years
- Malignant neoplasm of thyroid gland, C73, 0–74 years
- Hodgkin’s disease, C81, 0–74 years
- Leukaemia, C91, C92.0, 0–44 years
- Benign neoplasms, D10–D36, 0–74 years

**Nutritional, endocrine and metabolic**
- Diabetes mellitus, E10–E14, 0–49 years

**Neurological disorders**
- Epilepsy and status epilepticus, G40–G41, 0–74 years

**Cardiovascular diseases (CVD)**
- Rheumatic and other valvular heart disease, I01–I09, 0–74 years
- Hypertensive diseases, I10–I15, 0–74 years
- Ischaemic heart disease, I20–I25, 0–74 years
- Cerebrovascular diseases, I60–I69, 0–74 years

**Respiratory diseases**
- Influenza (including swine flu), J09–J11, 0–74 years
- Pneumonia, J12–J18, 0–74 years
- Asthma, J45–J46, 0–74 years

**Digestive disorders**
- Gastric and duodenal ulcer, K25–K28, 0–74 years
- Acute abdomen, appendicitis, intestinal obstruction, cholecystitis / lithiasis, pancreatitis, hernia, K35–K38, K40–K46, K80–K83, K85,K86.1-K86.9, K91.5, 0–74 years

**Genitourinary disorders**
- Nephritis and nephrosis, N00–N07, N17–N19, N25-N27, 0–74 years
- Obstructive uropathy & prostatic hyperplasia, N13, N20–N21, N35, N40, N99.1, 0–74 years

**Maternal & infant**
- Complications of perinatal period, P00–P96, A33, All years
- Congenital malformations, deformations and chromosomal anomalies, Q00–Q99, 0–74 years

**Injuries**
- Misadventures to patients during surgical and medical care, Y60–Y69, Y83–Y84, All years
Annex H: The ‘Never Events’ list 2012/13

These incidents are considered unacceptable and eminently preventable24.

**SURGICAL**

1. **Wrong site surgery**
   A surgical intervention performed on the wrong site (for example wrong knee, wrong eye, wrong patient, wrong limb, or wrong organ); the incident is detected at any time after the start of the operation and the patient requires further surgery, on the correct site, and/or may have complications following the wrong surgery.
   - Includes biopsy, radiological procedures and drain insertion, where the intervention is considered surgical.
   - Excludes wrong site anaesthetic block.
   - Excludes interventions where the wrong site is selected because of unknown/unexpected abnormalities in the patient’s anatomy. This should be documented in the patient’s notes.

2. **Wrong implant/prosthesis**
   Surgical placement of the wrong implant or prosthesis where the implant/prosthesis placed in the patient is other than that specified in the operating plan either prior to or during the procedure. The incident is detected at any time after the implant/prosthesis is placed in the patient and the patient requires further surgery to replace the incorrect implant/prosthesis and/or suffers complications following the surgery.
   - Includes swabs, needles, implants, fragments of screws, instruments and guidewires.
   - Excludes where any relevant objects are found to be missing prior to the completion of the surgical intervention and may be within the patient, but where further action to locate and/or retrieve would be more damaging than retention, or impossible. This must be documented in the patient’s notes and the patient informed.

3. **Retained foreign object post-operation**
   Unintended retention of a foreign object in a patient after surgical intervention, including interventional radiology, cardiology and vaginal birth.
   - Includes swabs, needles, implants, fragments of screws, instruments and guidewires.
   - Excludes where any relevant objects are found to be missing prior to the completion of the surgical intervention and may be within the patient, but where further action to locate and/or retrieve would be more damaging than retention, or impossible. This must be documented in the patient’s notes and the patient informed.

**MEDICATION EVENTS**

4. **Wrongly prepared high-risk injectable medication**
   Death or severe harm as a result of a wrongly prepared high-risk injectable medication.
   - High-risk injectable medicines are identified using the NPSA’s risk assessment tool1. A list of high-risk medicines has been prepared by the NHS Aseptic Pharmacy Services Group using this tool2. Organisations should have their own list of high-risk medications for the purposes of the ‘never event’ policy, which may vary from the NHS Aseptic Pharmacy Services Group list, depending on local circumstances.
     - A high risk injectable medicine is considered wrongly prepared if it was not;
     - prepared in accordance with the manufacturer’s Specification of Product Characteristics;
     - prepared in accordance with a protocol formally agreed by the local organisation (for example for off-label or unlicensed product use);
     - prepared in accordance with patient specific directions of a prescriber in an urgent or emergency situation and supported by evidence or expert advice.
     - This event excludes any incidents that are covered by other ‘never events’.
     - Where death or severe harm cannot be attributed to incorrect preparation, treat as a Serious Untoward Incident.

5. Maladministration of potassium-containing solutions
Death or severe harm as a result of maladministration of a potassium-containing solution. Maladministration refers to:
• selection of strong potassium solution instead of intended other medication,
• wrong route administration, for example a solution intended for central venous catheter administration given peripherally,
• infusion at a rate greater than intended.

6. Wrong route administration of chemotherapy
Intravenous or other chemotherapy (for example, vincristine) that is correctly prescribed but administered via the wrong route (usually into the intrathecal space).

7. Wrong route administration of oral/enteral treatment
Death or severe harm as a result of oral/enteral medication, feed or flush administered by any parenteral route.

8. Intravenous administration of epidural medication
Death or severe harm as a result of intravenous administration of epidural medication.
• broader ‘never event’ covering intravenous administration of intrathecal medication or intrathecal administration of intravenous medication is intended once the deadlines for Patient Safety Alert 004A and B actions have passed.

9. Maladministration of Insulin
Death or severe harm as a result of maladministration of insulin by a health professional. Maladministration in this instance refers to when a health professional:
• fails to use a specific insulin administration device e.g. an insulin syringe or insulin pen to draw up or administer insulin, or
• fails to give insulin when correctly prescribed.

10. Overdose of midazolam during conscious sedation
Death or severe harm as a result of overdose of midazolam injection following use of high strength midazolam (5mg/ml or 2mg/ml) for conscious sedation.
Excludes areas where use of high strength midazolam is appropriate. These are specifically only in general anaesthesia, intensive care, palliative care, or where its use has been formally risk assessed.
Excludes paediatric care.

11. Opioid overdose of an opioid-naïve patient
Death or severe harm as a result of an overdose of an opioid given to a patient who was opioid naïve.
Specifically this means:
• Where a dose is used that is not consistent with the dosing protocol agreed by the healthcare organisation, or the manufacturer’s recommended dosage for opioid-naïve patients*.
• Where the prescriber fails to ensure they were familiar with the therapeutic characteristics of the opioid prescribed. Excluded are cases where the patient was already receiving opioid medication.

MENTAL HEALTH

13. Suicide using non-collapsible rails
Death or severe harm to a mental health inpatient as a result of a suicide attempt using non-collapsible curtain or shower rails.

14. Escape of a transferred prisoner
A patient who is a transferred prisoner escaping from medium or high secure mental health services where they have been placed for treatment subject to Ministry of Justice restriction directions.
15. Falls from unrestricted windows
Death or severe harm as a result of a patient falling from an unrestricted window.
Applies to windows ‘within reach’ of patients. This means windows (including the window sill) that are within reach of someone standing at floor level and that can be exited/fallen from without needing to move furniture or use tools to assist in climbing out of the window.
Includes windows located in facilities/areas where healthcare is provided and where The ‘never events’ list 2012/13 patients can and do access.
Includes where patients deliberately or accidentally fall from a window where a restrictor has been fitted but previously damaged or disabled, but does not include events where a patient deliberately disables a restrictor or breaks the window immediately before the fall.

16. Entrapment in bedrails
Death or severe harm as a result of entrapment of an adult in bedrails that do not comply with Medicines and Healthcare products Regulatory Agency (MHRA) dimensional guidance.

17. Transfusion of ABO-incompatible blood components
Death or severe harm as a result of the inadvertent transfusion of ABO-incompatible blood components.
Excludes where ABO-incompatible blood components are deliberately transfused with appropriate management.

18. Transplantation of ABO incompatible organs as a result of error
Death or severe harm arising from inadvertent ABO mismatched solid organ transplantation
Excluded are scenarios in which clinically appropriate ABO incompatible solid organs are transplanted deliberately. In this context, ‘incompatible’ antibodies must be clinically significant. If the recipient has donor-specific anti-ABO antibodies and is therefore likely to have an immune reaction to a specific ABO incompatible organ, then it would be a ‘never event’ to transplant that organ inadvertently and without appropriate management.

19. Misplaced naso- or oro-gastric tubes
Death or severe harm as a result of a naso- or orogastric tube being misplaced in the respiratory tract.

20. Wrong gas administered
Death or severe harm as a result of the administration of the wrong gas, or failure to administer any gas, through a line designated for Medical Gas Pipeline Systems (MGPS) or through a line connected directly to a portable gas cylinder.

21. Failure to monitor and respond to oxygen saturation
Death or severe harm as a result of failure to monitor or respond to oxygen saturation levels in a patient undergoing general or regional anaesthesia, or conscious sedation for a healthcare procedure (e.g. endoscopy).
Includes failure to physically have monitoring in place, and failure to act on relevant information from monitoring oxygen saturation.
Excludes where action is taken in response to recorded adverse oxygen saturation levels, but this fails to prevent death or severe harm for other reasons (e.g. pre-existing problems with oxygenation that cannot be resolved).
Excludes incidents where the accepted limitations of monitoring equipment mean that adverse readings may be artefactual (e.g. shock/vasoconstriction).
22. Air embolism

Death or severe harm as a result of intravascular air embolism introduced during intravascular infusion/bolus administration or through a haemodialysis circuit.

Excludes:

• The introduction of air emboli through other routes. This therefore excludes introduction via surgical intervention (particularly Ear, Nose and Throat surgery and neurosurgery), during foam scleropathy and during the insertion of a central venous catheter.

• Introduction of an air embolism after the insertion of a central venous catheter, through the line, and during its removal, is included.

• Excludes where the introduction of the air embolism was caused by the actions of the patient.

23. Misidentification of patients

Death or severe harm as a result of administration of the wrong treatment following inpatient misidentification due to a failure to use standard wristband (or identity band) identification processes.

• Failure to use standard wristband identification processes means;

• Failure to use patient wristbands that meet the NPSA’s design requirements.

• Failure to include the four core patient identifiers on wristbands – last name, first name, date of birth and NHS number.

• Failure to follow clear and consistent processes for producing, applying and checking patient wristbands.

• Printing several labels with patient details at one time.

This definition excludes those units where wristbands are deliberately not used, primarily some mental health inpatient units (this requires local agreement).

It also excludes instances where the patient refuses to wear a wristband despite a clear explanation of the risks of not doing so, or where it has been documented that the patient cannot wear a wristband due to their clinical condition or treatment, or in emergency care environments where high patient turnover, insufficient patient identity information, or the need for rapid treatment can delay wristband use.

24. Severe scalding of patients

Death or severe harm as a result of a patient being scalded by water used for washing/bathing

• Excludes scalds from water being used for purposes other than washing/bathing (eg from kettles).

MATERNITY

25. Maternal death due to post partum haemorrhage after elective caesarean section

In-hospital death of a mother as a result of haemorrhage following elective caesarean section.

Excludes:

• cases where placenta accreta is found, or where there is a pre-existing bleeding disorder, or the mother refuses blood components for any reason.

• emergency caesarean section and where a scheduled elective caesarean section is brought forward.
Annex I: Gold standards framework

What is the Gold Standards Framework\(^{15}\)?
A framework to deliver a ‘gold standard of care’ for all people with advanced disease, nearing the end of their lives.

**One Aim – one ‘Gold Standard’ to aspire to for ALL patients nearing the end of life, whatever the diagnosis, stage or setting. Aim for the best for all.**

The aim of the Gold Standards Framework for community palliative care is to develop a practice or locally based system to improve and optimise the organisation and quality of care for patients and their carers in the last year of life.

**Three Processes – all involving improved communication, are to:**
1. Identify patients in need of palliative/supportive care towards the end of life.
2. Assess their needs, symptoms, preferences and any issues important to them.
3. Plan care around patient’s needs and preferences and enable these to be fulfilled, in particular to allow patients to live and die where they choose.

**Five Goals of the Gold Standards Framework**
1. Symptom free-patients’ symptoms are as well controlled as possible.
2. Place of care – patients are enabled to live well and die well where they choose.
3. Security and support – better advanced care planning, information, less fear, fewer crisis or admissions to hospital.
4. Carers are supported, informed, enabled and empowered.
5. Staff confidence, team-working, satisfaction, communication are better.

**Seven Key tasks – the 7 C’s**
These detail specific tasks and assess and suggest means to achieve them

- C1 Communication.
- C2 Co-ordination.
- C3 Control of symptoms.
- C4 Continuity including out of hours.
- C5 Continued learning.
- C6 Carer Support.
- C7 Care in the dying phase.

\(^{15}\) [www.goldstandardsframework.org.uk](http://www.goldstandardsframework.org.uk)