Using data to improve surgical care
~ The second cycle of the surgical profiles project
NHS Quality Improvement Scotland (NHS QIS) is committed to equality and diversity in respect of the six equality groups defined by age, disability, gender, race, religion/belief and sexual orientation. The surgical profiles process has been assessed, and no adverse impact across any of these groups is expected.
Foreword

A clinician, clinical team or hospital should know what their patient outcomes are – and they should also be able to demonstrate that such information guides improvements to the care they provide in future. The aim of the surgical profiles project is to contribute to the development of a culture whereby people and organisations providing clinical services routinely use data to stimulate review of their work, and to drive improvements in patient care and outcome.

Specifically, the project aims to lead to better and more widespread use of existing Scotland-wide data sources, by i) bringing together a series of clinical indicators in one place (the surgical profile), and ii) linking the profile to a process designed to facilitate the use of these data in practice.

When we reported on the initial cycle of the project in the Autumn of 2007¹, I noted the encouraging early signs that this approach was having the desired impact. Since then, the importance of making good use of existing data sources has become even more apparent.²,³

The surgical profiles project is having an increasing effect. This is clearly shown in the actions that NHS Boards across Scotland have reported to NHS Quality Improvement Scotland that they are carrying out in response to the profile. These cover a range of measures designed to improve the quality of patient care.

The responses to a questionnaire survey confirm that there is broad support for the approach behind the production/use of the profile. Therefore, in response to encouragement from NHS Boards, we have begun the development and testing of a medical profile.

I would like to thank the many people who have contributed much hard work and expertise to this project – in particular those who are reviewing their own data and are making efforts to improve the care they provide. Their contributions to the continuation of the surgical profiles project should show fruit, both through reductions in variation and, at least as important, by raising the level of ‘average’ achievement in the treatment of people receiving surgical care across Scotland.

Sir Graham Teasdale
Chairman, NHS Quality Improvement Scotland

Executive summary

Approach:

1 The aim of the surgical profiles project is to lead to better and more widespread use being made of existing Scotland-wide data sources in guiding improvements to surgical care and outcomes for patients. In order to achieve this aim, a series of clinical indicators is drawn together in one place (the surgical profile), and the profile is linked to a process designed to facilitate the use of these data in practice.

2 Each NHS Board is given its own surgical profile, presenting clinical indicators at the level of NHS Board and hospital (there are no data about individual clinicians or patients). The data are presented so that each NHS Board can monitor its own data over a period of time, and also make comparisons with other service providers. Statistical process control techniques are used to identify marked variations in the data and, by doing so, to flag up areas worthy of further consideration.

3 The initial surgical profile, produced in 2006, presented data on three broad topics: surgical mortality; general and vascular surgery, and: orthopaedic surgery. The second iteration of the profile, given to NHS Boards in December 2008, also includes indicators on paediatric surgery, urology, gynaecology, and ear, nose and throat surgery. The profile presents more than seventy indicators including, for example, data on: the volume of procedures carried out; mortality; unplanned readmission to hospital; deep vein thrombosis/pulmonary embolism, and: post operative infection.

4 One factor that may contribute to observed variation on an indicator is case-mix – that is, characteristics of the patients being cared for at a particular hospital. There are statistical methods (case-mix adjustment techniques) that can be used to take various patient characteristics into account, and most of the clinical indicators in the surgical profile are adjusted to take account of age, sex and social deprivation. In addition, the Information Services Division (ISD) has developed a more sophisticated model to take account of additional case-mix variables (including primary diagnosis and prior morbidity). This model has been used to produce the mortality indicators in the surgical profile.

5 The surgical profile is designed to be interpreted and used locally by those providing surgical care, in order to stimulate reflection on surgical services – and, in so doing, to identify opportunities for improving patient care. The profile alone cannot be used as a basis for making reliable judgements about the quality of clinical care in a particular NHS Board/hospital, and attempting to do so could lead to incorrect conclusions being drawn.

4 While the first surgical profile was produced in both printed and electronic format, the second iteration is only available online. The web pages displaying the data were password protected in the first instance, and could only be accessed by NHS Boards – although the password protection has been removed to coincide with the publication of this report.
To try and ensure that the data are being reviewed and, where necessary, acted upon, NHS Quality Improvement Scotland (NHS QIS) has a dialogue with each NHS Board about its profile. For the second iteration of the profile, each NHS Board was asked to provide a formal response to its profile by April 2009, describing how the data are being reviewed and responded to locally. A national clinically-led panel then reviewed the responses, and provided feedback to each NHS Board in June 2009 about how it reported it is using its data.

Findings:

All fifteen NHS Boards that provide surgical services were given a profile, together with guidance on how to use and respond to the data. The review panel concluded that fourteen NHS Boards described appropriate and proportionate efforts to review and act upon the data locally. The panel also agreed that NHS Boards’ responses collectively have improved since the initial cycle of the project. Indeed, six NHS Boards (Fife, Forth Valley, Grampian, Greater Glasgow & Clyde, Highland, and Lothian) provided a response that was considered to be excellent – three times the number compared with the initial cycle of the project.

However one NHS Board, NHS Western Isles, has not provided an adequate response to demonstrate that it is using available data to stimulate reflection on, and improvements to, the services it provides for the population of the Western Isles. This is the case for both the initial and second cycles of the project.

Throughout Scotland, numerous activities are being carried out to act upon the data in the profile. Some of these are aimed at improving the data themselves (eg to tackle problems with clinical coding) or the governance systems within NHS Boards/hospitals. Many of the actions, however, focus directly on the delivery of clinical care.

Most NHS Boards have asked ISD for additional data in order to help them get an understanding of the factors underlying the trends observed in the profile. For example, ISD has provided information about which cases contribute to specific data points – and this has allowed NHS Boards to carry out case note reviews to learn, for example, from instances where there have been a higher number of surgical deaths than expected. NHS QIS is following up on the actions that NHS Boards have reported they are carrying out.
Future work:

11 In the meantime, NHS QIS carried out a questionnaire survey to help find out if the project is meeting its objectives. In general, the project appears to have been well received among its target audience within NHS Boards, with the majority of respondents reporting that the profile highlighted issues they had previously been unaware of. Many stated that there have been changes locally as a direct result of using the profile.

12 Respondents are overwhelmingly in favour of the surgical profiles project continuing, and indeed almost three-quarters stated they would welcome the roll out of this approach to other clinical topics. The results of the survey will be used to inform the development and testing of a prototype medical profile, as well as the ongoing work on the surgical profiles project.

13 While the initial work on the surgical profiles project has focused primarily on the dialogue with individual NHS Boards about their own data, there will be an increasing emphasis on reducing the variation observed throughout Scotland on key indicators, as well as on improving the national average. For example, in addition to the interactions with individual NHS Boards, NHS QIS will seek to work with national groups (eg clinical specialty groups) to review and act upon Scotland-wide patterns in the data.
Background to surgical profile

The production of clinical indicators – that is, quantitative measures about specific aspects of patient care – has become increasingly commonplace worldwide\(^5\). Indicators are now widely regarded as being a vital tool for supporting improvements to, and the accountability of, health services.

Indeed, organisations and individuals that provide clinical services need a range of data to monitor, and drive improvements to, the provision and outcomes of patient care. Clinical indicators, drawn from centrally maintained national datasets, can flag up areas where further local investigation and quality improvement activities might be fruitful. More detailed information from local (and often clinically led) data systems is also required to run safe and effective clinical services, and can be used to gain insights into areas highlighted by indicators.

Scotland became the first country in Europe to publish clinical indicators for a national health service when indicators were initially produced and placed in the public domain in 1993\(^6\). This was possible in Scotland because there was both the (policy) will to publish such information, together with the (technical) way to produce indicators\(^7\) – the latter in the shape of the pioneering work led by ISD to link together data from different health (and related) records.

Since then, Scotland has maintained its strong track record in collecting clinical data. There are a number of well established nationwide projects which collect data on specific clinical topics. In addition, nationally consistent information on many other aspects of healthcare (both clinical processes and outcomes) can be derived from routine administrative datasets.

**However, is NHSScotland fully exploiting the rich data sources it has at its disposal?**

Collecting/analysing data is complex, resource intensive, and necessary – yet it is not in itself sufficient for driving improvements to patient care and the health and wellbeing of the population. In addition, it is fundamentally important that data are *used in practice*. Despite this, relatively little effort is typically focused on supporting the use of clinical indicators per se compared with the attention directed towards the more technical (and tangible) aspects of data collection, analysis, and presentation. The scenario described is observed in many countries – including Scotland.

The surgical profiles project was set up specifically to redress this imbalance, and to lead to better and more widespread use being made of existing Scotland-wide data sources in supporting improvements to patient care. Surgery was chosen as the initial topic for this work as, in comparison with other clinical areas, there is a relatively well established tradition of data collection.

---

\(^5\) Mason A & Street A. To publish or not? Experience and evidence about publishing hospital outcomes data. OHE (2005).


Surgical profile methodology

The approach developed for the surgical profiles project consists of two main components. First, a series of clinical indicators is drawn together in one place (the surgical profile). Second, the profile is linked to a process designed to facilitate the use of these data in practice.

The production of the profile itself is overseen by a clinically led design group (membership of this group is presented in Appendix 2), working primarily with ISD and also with other clinicians.

The data in the surgical profile are presented at the level of NHS Board and hospital, and there are no data about individuals (either clinicians or patients). Each NHS Board can compare its own data with those for other NHS Boards/hospitals and with the national average, and it can also monitor its own data over a period of time.

The initial profile, produced in 2006, presented data on three broad topics: surgical mortality; general and vascular surgery, and: orthopaedic surgery. The second iteration of the profile, given to NHS Boards in December 2008, also includes indicators on paediatric surgery, urology, gynaecology, and ear, nose and throat surgery. There are over seventy indicators in the profile\(^8\), including data on: the volume of procedures carried out; mortality; unplanned readmission to hospital; deep vein thrombosis/pulmonary embolism, and: post operative infection.

Most of the indicators are drawn from routine administrative data sources, and in particular the Scottish Morbidity Recording (SMR01) scheme run by ISD, and which hospitals contribute data to (SMR01 data are linked to information held by the General Register Office for Scotland to produce mortality indicators). Additional indicators are provided by the Scottish Audit of Surgical Mortality, the Scottish Hip Fracture Audit, and Health Protection Scotland.

---

\(^8\) A list of all the clinical indicators in the second surgical profile is included in appendix 1.
Following the release of the profile, NHS QIS has a dialogue with each NHS Board to try and ensure that the data are being reviewed and, where necessary, acted upon. This dialogue is carried out through a process whereby each NHS Board is asked to provide a formal written response to its surgical profile, describing how the data are being used locally to stimulate reflective clinical practice and improvements to patient care. The response, which is to be approved by the local clinical governance committee, is to cover all ‘outliers’ in the profile and also include an action plan.

Each NHS Board’s response is then considered by a clinically led national review panel (membership of this panel is presented in Appendix 2). The panel assesses each response using criteria based on the guidance issued to NHS Boards for using/responding to the profile (these criteria are listed in full in Appendix 3). Each NHS Board is then given feedback on how it reported it is using the profile.

For the second cycle of the surgical profiles project, each NHS Board was asked to submit its response to the profile by April 2009 – and each NHS Board was then given feedback from the panel in June 2009. In addition, NHS Boards have been asked to provide NHS QIS with an update, in December 2009, on the actions they reported they are carrying out to respond to the profile.
Variations in the data

The clinical indicators in the surgical profile are presented using statistical process control techniques. A control chart is a simple way of presenting data that can help guide quality improvement activities, by flagging up areas where there appears to be marked variation and where further local investigation might be beneficial. Control charts originated in the manufacturing industry, and their use is becoming increasingly widespread in healthcare settings. For example, they are perceived as being an advancement on the more traditional ‘league table’ approach for presenting comparative data.

There are two types of control chart in the surgical profile. The first (sometimes called a funnel plot) allows comparisons to be made across NHS Boards/hospitals. The second (sometimes called a longitudinal control chart) allows NHS Boards/hospitals to monitor their own data over a period of time.

The data in the profile are plotted in relation to the average rate for Scotland (funnel plots) or the average for the NHS Board/hospital in question (longitudinal control chart). Control limits are plotted at three standard deviations from the average, and these are used to identify instances of marked variation from this average. Data points lying within the control limits are said to exhibit common cause variation, or to be ‘in control’. Data points outwith the control limits (sometimes called ‘outliers’), and certain other patterns, are said to exhibit something called ‘special cause variation’. This is where further investigation is required.

Variation observed on an indicator may reflect a number of factors, such as i) characteristics of the patients being cared for (or case-mix), ii) the quality of clinical care, iii) inaccuracies in how hospitals code data and, iv) variation due to chance. Only by having a good understanding of local circumstances is it possible to ascertain the ways in which such factors contribute to the pattern of data observed – and even then additional (and sometimes considerable) work is required to pinpoint the cause(s). This is why the data in the profile cannot be used in isolation to make reliable external judgements about the quality of clinical care provided by an NHS Board/hospital.

In order to guard against a large number of ‘outliers’ occurring by chance variation, and the unnecessary work looking into these that would ensue, NHS Boards are required to respond only to data points lying greater than three standard deviations from the average. By doing so, only 3 in 1,000 ‘outliers’ flagged up would be expected to occur simply by chance.

In addition, for most of the indicators in the surgical profile statistical methods (case-mix adjustment techniques) are used to take account of some patient characteristics (see next page for further details). Nonetheless, case-mix adjustment techniques are necessarily incomplete, and aspects of case-mix that are not adjusted for (eg severity of illness) may still contribute to variations observed.

---

Case-mix

One factor that may contribute to observed variation on an indicator is case-mix (that is, characteristics of the patients being cared for). This is one reason why clinical indicators cannot be used to make reliable external judgements about the quality of clinical care, as knowledge of the local patient population is required to interpret the data.

There are statistical methods (case-mix adjustment techniques) that can be used to take various patient characteristics into account. Most of the clinical indicators in the surgical profile are adjusted to take account of age, sex and social deprivation. Case-mix adjustment techniques are necessarily incomplete because it is not possible to take account of all conceivable factors, and there are other patient characteristics (eg co-existing illnesses or diseases) that may also contribute to observed variation.

As explained in the report published following the initial cycle of the project, ISD has been working to develop improved case-mix adjustment techniques. Specifically, a model has been developed whereby data on mortality are adjusted to take account of variables including primary diagnosis and prior morbidity. This model has been used for the second surgical profile, and also for the Scottish Patient Safety Programme.

This new method of case-mix adjustment has been developed for the mortality indicators, and these indicators have been adjusted to take account of: the patient’s primary diagnosis; age; where the patient was admitted from; the number and severity of prior-morbidities they had in the previous year; the number of emergency admissions in the previous year; whether they were admitted as an inpatient or day case; the number and severity of prior-morbidities they had in the previous five years; type of admission (elective/non-elective), and; sex.

As expected, the application of this new model has led to some changes in the patterns observed on the mortality indicators compared with the initial surgical profile – although there has been feedback that the case-mix adjustment has greatly improved. Further work is now being carried out to review the new case-mix model, and this will inform the potential application of this model to other types of indicators in future.
NHS Boards’ responses

When each NHS Board was given its second surgical profile in December 2008, it was asked to provide NHS QIS with a written response to its data by April 2009.

Guidance on using and responding to the profile was issued at the same time as the data themselves. For example, a series of suggested questions for non-executive Board members to ask the clinical governance committee was provided, and ISD offered training on control charts.

All fifteen NHS Boards\(^{10}\) that provide surgical services were given a surgical profile, and a national panel (the Surgical Profiles Review Panel – membership included in Appendix 2) met twice – in April and May 2009 – to review the responses received.

The panel assessed each response against criteria based on the guidance issued to NHS Boards for responding to the profile. These criteria are presented in full in Appendix 3 and, to illustrate, for a response to be considered ‘satisfactory’ it is to:

i) describe how the profile is being used locally;

ii) cover the ‘outliers’ in the profile;

iii) comment on the charts about the timeliness/quality of data in the profile;

iv) include an action plan for responding to the data; and

v) be approved by the local clinical governance committee.

In addition, the panel could conclude that a response is excellent, for example if it covers subtler patterns in the data from the profile, or describes how other data sources are being used locally to drive improvements in patient care.

A response was received from each NHS Board that was given a profile, and the review panel was encouraged by how the profile is being used throughout Scotland. In summary, six of the fifteen NHS Boards provided a response that was considered by the panel to be ‘highly satisfactory’ (NHS Fife, NHS Forth Valley, NHS Grampian, NHS Greater Glasgow & Clyde, NHS Highland, and NHS Lothian). Of the remaining nine NHS Boards, eight provided a response that meets the key criteria (ie a ‘satisfactory’ response).

---

\(^{10}\) NHS Ayrshire & Arran, NHS Borders, NHS Dumfries & Galloway, NHS Fife, NHS Forth Valley, Golden Jubilee National Hospital, NHS Grampian, NHS Greater Glasgow & Clyde, NHS Highland, NHS Lanarkshire, NHS Lothian, NHS Orkney, NHS Shetland, NHS Tayside, NHS Western Isles
Only one NHS Board, NHS Western Isles, has not provided an adequate response to the profile to demonstrate that it is using available data to stimulate reflection on, and improvements to, the services it provides for the population of the Western Isles. This is the case for both the initial and second cycles of the project. NHS QIS has therefore asked NHS Western Isles to carry out specific actions to investigate the key patterns of data in its profile and to provide an update on these completed actions by 11 December 2009.

Overall, the panel felt that NHS Boards have described appropriate and proportionate efforts to review and act upon the data locally. The panel also agreed that NHS Boards’ responses have generally improved since the initial cycle of the project, as illustrated by the observation that six ‘highly satisfactory’ responses were received to the second profile compared with just two for the initial profile.

There are some similarities in how the profile is being used across Scotland. As for the initial cycle of the project, the profile is being reviewed by senior clinicians and managers, and in many NHS Boards clinical directors and clinical specialty leads play a key role in reviewing and responding to the data about their own areas of expertise. Again, NHS Boards typically reported that clinical governance and clinical effectiveness staff are involved in responding to the data.

The specific actions being carried out to review and respond to the profile vary from region to region. This is to be expected, if for no other reason than some NHS Boards are larger than others, and as a consequence are more likely to have a greater number of ‘outliers’. In addition, the particular indicators on which ‘outliers’ are observed vary across Scotland, again shaping the precise actions that are required to look into the data.

Throughout Scotland, numerous activities are being carried out to act upon the data in the profile. Some of these are aimed at improving the data themselves (eg to tackle problems with clinical coding) or the governance systems within NHS Boards/hospitals. Many of the actions, however, focus directly on clinical care.

Most NHS Boards have asked ISD for additional data in order to help them get an understanding of the factors underlying the trends observed in the profile. For example, ISD has provided information about which cases contribute to specific data points – and this has allowed NHS Boards to carry out case note reviews, for example to learn from instances where there have been a higher number of surgical deaths than expected. Such activities can take time, and many of the actions in response to the profile are still ongoing. NHS QIS has asked each NHS Board to provide an update in December 2009 on the actions it reported are being carried out in response to the profile.

In the meantime, to provide a flavour of the actions being undertaken throughout Scotland, some examples – drawn from the six NHS Board responses that were considered to be ‘highly satisfactory’ – are described here.
NHS Fife

The initial surgical profile flagged up a relatively high rate of deep vein thrombosis/pulmonary embolism within 90 days of admission to general surgery at Queen Margaret Hospital. In response to these data, the surgical directorate at the hospital reviewed the data collection and the guidance on thromboprophylaxis, and also audited compliance with this guidance. The data in the second profile illustrate that the rate of deep vein thrombosis/pulmonary embolism at Queen Margaret Hospital has fallen and is no longer markedly higher than the national average.

NHS Forth Valley

A clear action plan was provided in response to the profile – and NHS Forth Valley reported that progress against these actions is being monitored by the Surgical Unit Clinical Governance Committee, with updates to the Acute Services Clinical Governance Working Group and the Board Clinical Governance Committee. For example, the profile flagged up a relatively high rate of mortality at 120 days following transurethral resection of bladder tumours for one quarter – and NHS Forth Valley reported that the urological surgeons already have processes in place to review post operative deaths at morbidity and mortality meetings.

NHS Grampian

In response to the initial profile, a case note review of patients who died of suspected pulmonary embolism or unexplained cardiac events was carried out, using a tool (the Global Trigger Tool) designed to facilitate case-note reviews. The learning from this is feeding into work that is being carried out, under the auspices of the Scottish Patient Safety Programme, to improve the perioperative workstream, eg ensuring that thromboprophylaxis is given appropriately. NHS Grampian has also sought supplementary data from ISD in order to look into the apparently high volume of tonsillectomy procedures performed, as flagged up by the second profile.
**NHS Greater Glasgow & Clyde**

The profile presented data showing an apparently high rate of infected prosthesis following knee arthroplasty (joint replacement) at Glasgow Royal Infirmary, and these data prompted a detailed review involving consultant orthopaedic surgeons at the hospital. The review found a significantly lower incidence of deep seated joint infection than was apparent from the high level data in the profile. In addition, the review found no cause for concern with any individual surgeon or with any single theatre – although the routine administration of antibiotic prophylaxis was identified as an area where there was potential to improve clinical practice. This is being addressed with the introduction of the surgical pause into all elective orthopaedic theatres at the hospital, and infection rates will continue to be monitored.

**NHS Highland**

NHS Highland asked ISD for additional data to look into the apparently high volume of abdominal hysterectomies performed. The number of procedures carried out was higher than expected at Caithness General Hospital, and the local obstetric and gynaecology team is reviewing individual cases to ascertain whether the clinical care was in line with best practice. The profile also highlighted an apparently high rate of mortality within 120 days of elective admission for cholecystectomy for one quarter at Lorn & Islands Hospital – and work is underway within the hospital to review these cases and determine if there are lessons to be learnt.

**NHS Lothian**

The profile flagged up marked variation between regions of the country in the proportion of residents who had a procedure for a prolapsed disc, and the rate for NHS Lothian was significantly higher than the Scottish average. NHS Lothian has set up a cross specialty review to examine the growth in neurosurgical disc repair, and this will include the analysis of clinical outcomes data from the neurosciences and orthopaedics departments. In addition, an audit is being carried out to understand the causes of the apparently excess length of stay following thyroidectomy at St John’s Hospital.
Timeliness of data

One of the most frequent criticisms made about the sort of data included in the surgical profile is that they are too out-of-date. To illustrate, many of the clinical indicators included in the profile released in December 2008 cover the time period October 2006-September 2007. That is, most of the data are at least a year out-of-date by the time they are made available to NHS Boards – and what they really need are ‘real time’ data.

This can lead to the scenario whereby, due to a reconfiguration of clinical services, an NHS Board is asked to review and respond to data corresponding to an old model of care. The out-of-date-ness of the data clearly poses a significant barrier to the use of such information.

This time lag reflects a number of factors implicated in both the submission of data by NHS Boards for analysis centrally (eg clinicians providing information to the coding department, and the processing of this information by trained coders), and the central analysis and feeding back of data to NHS Boards (eg quality assuring a large volume of charts).

NHS QIS and ISD are committed to working with NHSScotland to improve the timeliness of data. This includes continually reviewing, and where necessary changing, the procedures for analysing data centrally and feeding back data to NHS Boards. For example, publishing data online has resulted in the data being a little more up-to-date compared with the original surgical profile.

To give this issue the prominence it merits, the surgical profile includes some charts specifically on the timeliness of data, in order to help NHS Boards understand how quickly they are submitting data for analysis centrally. It is encouraging to note that for SMR01 data, which are used to produce many of the indicators in the profile, there is a marked increase in the proportion of records that hospitals submit to ISD within the six week target set by the Scottish Government. This has risen from 43% in July 2006 to an estimated 83% by June 2008.

It should be noted that, if the surgical profile draws attention to a particular issue for an NHS Board, it may well be the case that more up-to-date and/or detailed analyses can be provided to augment the information in the profile. Indeed, ISD is providing such supplementary data to NHS Boards that have requested this.

However, it cannot be considered acceptable in the long term that data are over a year out-of-date. NHS QIS and ISD will now therefore hold a workshop, involving key stakeholders, to identify both the barriers to the timely provision of data, and also actions aimed at tackling these problems.
Impact of surgical profile

While the reporting of clinical indicators has become increasingly commonplace worldwide as a means of driving improvements to health care there has, in stark contrast, been remarkably little effort targeted at assessing the impact of this approach.

Some insight into the impact of the surgical profiles project can be gleaned from the responses to the profile although, understandably, NHS Boards might be reluctant to use this as an opportunity to air any criticisms of the project. NHS QIS therefore carried out a questionnaire survey in August-September 2009, in order to get a better understanding of NHS Boards’ perceptions of the project.

A questionnaire was sent to three people in each of the fifteen NHS Boards (Medical Director, clinical governance lead, Chairman of Clinical Governance Committee), and 23 out of 45 questionnaires were returned (responses were anonymous).

The results highlight some important issues. And for example, about two thirds of Medical Directors/clinical governance leads reported that they have confidence in the validity of the data included in the profile – while the remaining third are either ‘not very confident’ or ‘not at all confident’ in the validity of the data.

Over a quarter of respondents stated that the overall approach taken for the project is very useful, and about a further two thirds reported it is quite useful. Over half of Medical Directors/clinical governance leads reported that, in their opinion, there have been changes in practice or approaches to practice in their NHS Board as a consequence of the surgical profiles project. Over two thirds said it has provided a catalyst to review and develop greater robustness around the governance systems relating to surgery.

Perhaps most tellingly, there is broad support both for the surgical profiles work continuing in the future, and also for the development of a medical profile.
Conclusions and next steps

The information that NHS Boards provided in response to the second iteration of the surgical profile, when considered together with the results of the questionnaire survey, suggest that the project is making good progress towards its aim of leading to better use being made of existing data.

Work will therefore continue on the project, with the aim of producing the third iteration of the surgical profile towards the end of 2010. As the project develops, NHS QIS will seek to align this work with the healthcare quality strategy for NHSScotland that is currently being developed, as well as strengthening links with other initiatives such as the Scottish Patient Safety Programme.

In addition, NHS QIS and ISD will seek to work more closely with relevant clinical specialty groups in order to identify the indicators to include in the profile – and also to review Scotland-wide patterns in the data. The latter will augment the existing dialogue with individual NHS Boards about their own data, and will help put a greater emphasis in future on reducing the variation observed throughout Scotland on key indicators, as well as on improving the national average.

Following from this, as the project develops there will be a greater focus on comparing trends in the data from one iteration of the profile to the next. It is not possible to make straightforward comparisons between the data in the first and second iterations of the surgical profile, because i) many of the indicators changed, and ii) an improved case-mix adjustment model was used to produce the mortality indicators for the most recent profile (and this led to changes in the pattern of data observed). However, in future it is important that there is stability in the content of the profile so that it is possible to make observations about the quality of patient care at Scotland-level.

In the meantime, each NHS Board is to provide an update on the actions it reported it will carry out in response to the second profile, and the Surgical Profiles Review Panel will reconvene in January 2010 to consider these updates. ISD will lead a workshop on case-mix adjustment methodology in November 2009, and opportunities for improving the timeliness of routinely collected data will be explored. NHS QIS and ISD also recognise that there are particular challenges in presenting comparative data for remote and rural services, and work on this topic is underway.

The overall approach taken for the surgical profiles project will also be extended to other clinical areas, and work to develop and test a prototype medical profile is underway. This work is being overseen by a Medical Profiles Project Group, and two NHS Boards will test using the prototype medical profile in 2010.
Appendix 1: List of indicators in profile

The following clinical indicators are included in the second iteration of the surgical profile:

**Surgical mortality – all specialties**

- Rate of mortality at 120 days following elective admission to a surgical specialty (for all admissions, and also for those admissions where an operation was performed)
- Rate of mortality at 120 days following non-elective admission to a surgical specialty (for all admissions, and also for those admissions where an operation was performed)
- Percentage of returns to the Scottish Audit of Surgical Mortality where i) no adverse event was recorded, and ii) an adverse event contributed to death
- Percentage of cases reviewed for the Scottish Audit of Surgical Mortality where i) a post-mortem was carried out, and ii) the death was discussed at a surgical mortality and morbidity meeting

**General and vascular surgery**

- Rate of mortality at 120 days following admission to general surgery (for both elective and non-elective admissions)
- Rate of deep vein thrombosis/pulmonary embolism within 90 days of admission to general surgery
- Rate of emergency readmission within 28 days of discharge from general surgery (for referrals to both medical and surgical specialties)
- Rate of i) mortality at 120 days for both elective and non-elective admissions for cholecystectomy surgery and, ii) emergency readmission within 28 days of discharge following cholecystectomy surgery
- Volume of patients discharged following admission for cholecystectomy surgery (for both elective and non-elective admissions)
- Percentage of patients receiving cholecystectomy surgery as a laparoscopic / endoscopic / thorascopic procedure (for both elective and non-elective admissions)
• Post-operative length of stay following cholecystectomy surgery (for both elective and non-elective admissions)

• Volume of procedures for; i) thyroidectomy, ii) repair of inguinal hernia and, iii) amputation

• Post-operative length of stay following i) elective thyroidectomy surgery and, ii) emergency appendicectomy

• Percentage of elective admissions, where patients have an inguinal hernia procedure performed laparoscopically / endoscopically / thorascopically.

• Rate of mortality at 30 days following amputation

• Percentage of anterior resections resulting in stoma

• Percentage of returns to the Scottish Audit of Surgical Mortality where; i) no adverse event was recorded and, ii) an adverse event contributed to death (for both general and vascular surgery)

Orthopaedics

• Rate of mortality at 120 days following admission to orthopaedic surgery (for both elective and non-elective admissions)

• Rate of deep vein thrombosis / pulmonary embolism within 90 days of admission to orthopaedic surgery

• Rate of emergency readmission within 28 days of discharge from orthopaedic surgery

• Rate of survival at i) 120 days and, ii) 30 days, following admission for hip fracture

• Percentage of patients who returned home within 120 days following admission for hip fracture

• Rate of deep vein thrombosis / pulmonary embolism within 90 days of admission for hip fracture

• Rate of emergency readmission within 28 days of discharge following admission for hip fracture

• Rate of mortality within 90 days of hip arthroplasty
• Rate of i) dislocation, and ii) infected prosthesis within 365 days of hip arthroplasty
• Rate of deep vein thrombosis / pulmonary embolism within 90 days of hip arthroplasty
• Rate of mortality within 365 days of knee arthroplasty
• Rate of i) revision and, ii) infected prosthesis, within 365 days of knee arthroplasty
• Rate of deep vein thrombosis / pulmonary embolism within 90 days of knee arthroplasty
• Volume of patients admitted to orthopaedic surgery with a lumbar prolapsed disc where a procedure was performed
• Rate of readmission for back complaints within 365 days of prolapsed disc surgery
• Incidence of surgical site infection for i) primary total hip arthroplasty and, ii) primary hemi hip arthroplasty
• Percentage of returns to the Scottish Audit of Surgical Mortality from orthopaedic surgery where i) no adverse event was recorded and, ii) an adverse event contributed to death

**Paediatrics**

• Percentage of circumcisions that are carried out for boys aged between 1-5 years
• Volume of hydrocele repair procedures in children aged below two years
• Volume of emergency appendicectomy procedures in children aged below 12 years
• Post operative length of stay following emergency appendicectomy in children aged below 12 years
**Urology**

- Rate of mortality at 120 days following transurethral prostatectomy for benign disease
- Rate of emergency readmission within 28 days of discharge following transurethral prostatectomy for benign disease
- Volume of procedures for transurethral prostatectomy for benign disease
- Post-operative length of stay following transurethral prostatectomy for benign disease
- Rate of mortality at 120 days following transurethral resection of bladder tumours
- Percentage of cauterisation for transurethral resection of bladder tumours
- Percentage of returns to the Scottish Audit of Surgical Mortality from urology where i) no adverse event was recorded and, ii) an adverse event contributed to death

**Gynaecology**

- Volume of patients discharged following an abdominal hysterectomy procedure
- Percentage of abortions performed surgically (gestation 9 weeks or less)

**Ear, Nose and Throat**

- Volume of patients discharged following tonsillectomy procedures
- Percentage of patients admitted with epistaxis who had a procedure performed
## Membership of Review Panel

<table>
<thead>
<tr>
<th>Name</th>
<th>Position and Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Adam Bryson OBE (Chairman)</td>
<td>Medical Director, NHS National Services Scotland (now retired)</td>
</tr>
<tr>
<td>Mr Roger Black</td>
<td>Head of Programme for Clinical Governance, Information Services Division, NHS National Services Scotland</td>
</tr>
<tr>
<td>Dr Sara Davies (Observer)</td>
<td>Medical Advisor, Scottish Government Health Directorates</td>
</tr>
<tr>
<td>Mr Fanus Dreyer</td>
<td>Consultant General Surgeon, Dumfries &amp; Galloway Royal Infirmary</td>
</tr>
<tr>
<td>Ms Evelyn Fleck</td>
<td>Clinical Group Manager, Surgery &amp; Oncology, Ninewells Hospital, Dundee</td>
</tr>
<tr>
<td>Dr Lesley Holdsworth</td>
<td>Head, Health Services Research &amp; Effectiveness, NHS Quality Improvement Scotland</td>
</tr>
<tr>
<td>Dr Cameron Howie</td>
<td>Clinical Director, Anaesthetics, Critical Care &amp; Pain Management, NHS Greater Glasgow &amp; Clyde</td>
</tr>
<tr>
<td>Mr Colin Howie</td>
<td>Consultant Orthopaedic Surgeon, The Royal Infirmary of Edinburgh</td>
</tr>
<tr>
<td>Mrs Stella MacPherson</td>
<td>NHS Quality Improvement Scotland Public Partner</td>
</tr>
<tr>
<td>Dr Nick Pace</td>
<td>Chairman of the Management Committee, Scottish Audit of Surgical Mortality/Consultant Anaesthetist, NHS Greater Glasgow &amp; Clyde</td>
</tr>
<tr>
<td>Dr Damien Reid</td>
<td>Chairman, Scottish Hip Fracture Audit/Consultant Physician in Medicine for the Elderly, NHS Lanarkshire</td>
</tr>
<tr>
<td>Mrs Helen Robbins</td>
<td>Head of Clinical Governance &amp; Risk Management, NHS Grampian</td>
</tr>
<tr>
<td>Professor Peter Stonebridge</td>
<td>Professor of Vascular Surgery, Ninewells Hospital and Medical School, Dundee</td>
</tr>
<tr>
<td>Dr Iain Wallace</td>
<td>Medical Director, NHS Quality Improvement Scotland</td>
</tr>
<tr>
<td>Dr Sandra Watson (Observer)</td>
<td>Senior Medical Officer, Scottish Government Health Directorates</td>
</tr>
</tbody>
</table>

Support from NHS Quality Improvement Scotland is provided by Dr Donald Morrison (Clinical Indicators Programme Manager) and Ms Jennifer Graham (Clinical Indicators Project Officer), and additional support from the Information Services Division is provided by Mr Richard Dobbie (Principal Statistician) and Ms Amy McKeon (Senior Statistician).
**Membership of Design Group**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr Roger Black</td>
<td>Head of Programme for Clinical Governance, Information Services Division, NHS National Services Scotland</td>
</tr>
<tr>
<td>Dr Penny Bridger</td>
<td>Consultant in Public Health Medicine, Information Services Division, NHS National Services Scotland</td>
</tr>
<tr>
<td>Mr Richard Dobbie (from March 2009)</td>
<td>Principal Statistician, Information Services Division, NHS National Services Scotland</td>
</tr>
<tr>
<td>Ms Jennifer Graham</td>
<td>Clinical Indicators Project Officer, NHS Quality Improvement Scotland</td>
</tr>
<tr>
<td>Dr Cameron Howie</td>
<td>Clinical Director, Anaesthetics, Critical Care &amp; Pain Management, NHS Greater Glasgow &amp; Clyde</td>
</tr>
<tr>
<td>Mr Colin Howie</td>
<td>Consultant Orthopaedic Surgeon, The Royal Infirmary of Edinburgh</td>
</tr>
<tr>
<td>Ms Linda Johnston</td>
<td>Clinical Audit Manager, University of Dundee</td>
</tr>
<tr>
<td>Dr Margaret MacLeod (until March 2009)</td>
<td>Principal Statistician, Information Services Division, NHS National Services Scotland</td>
</tr>
<tr>
<td>Ms Amy McKeon</td>
<td>Senior Statistician, Information Services Division, NHS National Services Scotland</td>
</tr>
<tr>
<td>Dr Donald Morrison</td>
<td>Clinical Indicators Programme Manager, NHS Quality Improvement Scotland</td>
</tr>
<tr>
<td>Mr Samuel Oduro</td>
<td>Statistician, Information Services Division, NHS National Services Scotland</td>
</tr>
<tr>
<td>Professor Peter Stonebridge (Chairman)</td>
<td>Professor of Vascular Surgery, Ninewells Hospital and Medical School, Dundee</td>
</tr>
</tbody>
</table>
Appendix 3 – Criteria for reviewing NHS Boards’ responses to profile

In order to allow the Surgical Profiles Review Panel to conclude that an NHS Board’s response to the profile is ‘satisfactory’ then the response is to provide:

- A description of how the surgical profile is being used locally. For example, who have the data been shared with, what fora have the data been discussed at?

- Feedback about all instances where there is marked variation in the data for that NHS Board/its hospital(s) (ie ‘outliers’). For example, how has the NHS Board attempted to gain an understanding of the data, what is the local interpretation of the data, what issues have been flagged up by the data, what actions have been carried out/planned to address these issues?

- Feedback about the charts from section 1 of the profile that present information on the timeliness/quality of the data used to produce the clinical indicators in the profile.

- A list of actions arising from reviewing the surgical profile, explaining when each action is to be completed by and who is responsible for this.

- Evidence that the response has been discussed and approved by the clinical governance committee.

For a response to be considered ‘highly satisfactory’ then it is also to cover such issues as:

- Trends in the data from the profile, other than ‘outlying’ data points, that are of interest locally.

- The usefulness of the data included in the surgical profile.

- How other data (ie data not included in the profile) are being used locally. These might be data collected specifically for local initiatives (eg a local clinical audit) or for other national initiatives (ie Scottish Patient Safety Programme).

- Any unintended/undesirable consequences that have arisen/could arise from the surgical profiles project.
Contacts and further information

Enquiries about the surgical profiles project should be directed in the first instance to:

Donald Morrison
Clinical Indicators Programme Manager
NHS Quality Improvement Scotland
Delta House
50 West Nile Street
Glasgow, G1 2NP

effect: donald.morrison@nhs.net
tel: 0141 225 6994

or

Amy McKeon
Senior Statistician
Information Services Division
NHS National Services Scotland
Area 143A
Gyle Square
1 South Gyle Crescent
Edinburgh, EH12 9EB

email: amy.mckeon@nhs.net
tel: 0131 275 6559

Further information about the surgical profiles project is available from the website of the Clinical Indicators Support Team at ISD:

www.indicators.scot.nhs.uk
You can read and download this document from our website. We can also provide this information:

- by email
- in large print
- on audio tape or CD
- in Braille (English only), and
- in community languages.

**NHS Quality Improvement Scotland**

Edinburgh Office
Elliott House
8-10 Hillside Crescent
Edinburgh EH7 5EA

Phone: 0131 623 4300
Textphone: 0131 623 4383
Email: comments.qis@nhs.net
Website: www.nhshealthquality.org

Glasgow Office
Delta House
50 West Nile Street
Glasgow G1 2NP

Phone: 0141 225 6999
Textphone: 0141 241 6316