

Maryland Hospital Quality Indicator Project in the United Kingdom: an approach for promoting continuous quality improvement

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Introduction

Hospitals increasingly wish to know how well they are performing and to have effective means of assessing and improving the quality of care that they provide. For this they require measures that are meaningful, interpretable, and of demonstrable value in helping to improve quality. One potential approach is the use of quality of care indicators.

The Joint Commission on Accreditation of Health Care Organisations in the United States has defined an indicator as "a quantitative measure that can be used to monitor and evaluate the quality of important governance, management, clinical, and support functions that affect patient outcomes"¹ Indicators, to be of value, should be valid, reliable, timely, comparable, and responsive to change.^{1,2} However, they are not direct measures of quality in themselves: they are tools that can support quality improvement and as with any tool, they can be used inappropriately.

There has been a recent interest in systems of external use of indicators that seem to emphasise negative findings, and be more concerned with making judgements on how badly hospitals are performing. Indeed, many health service indicators, such as those of the *patient's charter*, are primarily used for external assessment.^{3,4} However, as shown by the abandonment in the United States of the publication of hospital based mortality rates from the Medicare data,⁵ these methods may have limited effect in promoting quality improvement, and may indeed have significant adverse effects after wide publication of the data.^{6,7} As a stimulus to change they may generate inappropriate actions, such as the use of triage nurses in accident and emergency departments to minimise time until patients are first seen, followed by prolonged (but unrecorded) waiting for full assessment or treatment. These represent recognised adverse responses to the "bad apple" approach to quality so succinctly described by Berwick.⁸

The use of indicators in this way has stimulated a lively debate in the United Kingdom about the development and use of healthcare or quality indicators, echoing that in the United States in the 1980s.^{9,10,11} This has recently been apparent in the response to the public release of *patients' charter* indicators (such as immediate assessment in accident and emergency departments, waiting in outpatient

clinics, and arrival times of emergency ambulances) and of comparative hospital based outcome data from routine information sources in Scotland, leading to inevitable comparisons between hospitals.^{12,16} This debate is centred around several different, but interlinked issues: the validity and reliability of indicators; the use to which indicators are put as a basis for judgement about quality or as a catalyst for change; and the value of, and the need for, risk adjustment to indicators.

This paper describes the early experience of United Kingdom participation in a quality indicator project started at an acute hospital, the Maryland Hospital Quality Indicator Project (MHA QI Project®), which was developed specifically to meet the needs of participant hospitals. We firstly describe the history of the MHA QI Project in the United States. Then we describe the experience of piloting this project in the United Kingdom, expanding on the issues that this raises about the potential value and limitations of indicators as a means for quality improvement. Finally, the future development of the project in the United Kingdom is considered.

Development of the MHA QI Project in the United States

In the 1980s, hospitals within the state of Maryland wanted to answer the question "How well are we doing?". As a result the Maryland Hospital Association (MHA), a non-profit making organisation representing the interests of the trustees of the hospitals in that state (the direct community representatives legally responsible for the quality of care at their hospital), began a pilot project developing hospital wide quality indicators to support this aim.^{17,18} Initially, these indicators were developed locally within Maryland, on behalf of the State's own hospitals. They were piloted within the same hospitals that contributed to their development and evaluation — hence the indicators were initially, and continue to be, developed and refined by the users in the light of the needs and wishes of the participant hospitals. The indicators are very clearly defined within the project manual to ensure that participants are collecting comparable information.

Two key characteristics of the project are worth emphasising. Firstly, participation within the project is voluntary. Secondly, the

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indicators have been developed and promoted as a means for quality improvement rather than as an end in themselves. There is no system of external judgement and the organisers of the MHA QI Project have taken great care to emphasise that they are not defining standards related to the indicators, but that it is the task of the hospitals involved to use the indicators as they see fit within their own quality improvement strategies. It is not intended that the indicators be used punitively or to identify outliers, but rather within a continuous quality improvement model, looking also at the distribution and temporal movement of the majority. Thus, the overall aim of the MHA QI Project is to provide information which can be used as part of the hospital's continuous effort to measure and improve quality.

For this purpose the project provides complementary educational material and support to its participants. These include explanatory publications and suggestions on the use and interpretation of the indicators. Ultimately, the indicators prove useful by achieving a change in behaviour: the organisers of the MHA QI Project thus suggest a framework in which hospitals can use the indicators (fig 1) so the project supports hospitals in their own attempts at quality improvement.

This is crucial to understanding the role of these quality indicators. They are not themselves absolute measures of quality but act as flags or screens to support efforts to improve quality including clinical audit. The analogy of pointer dogs has been used to explain this. A pointer dog identifies the areas to be searched and indicates the presence of the pheasant. The search for good quality indicators is like the search for a good pointer dog. Indicators should identify areas where quality improvement efforts can be focused, but as with a pointer dog, this depends on the quality of the indicator itself. The value of an indicator will be reflected in its capacity to support quality improvement in the same way as the value of a pointer dog will be reflected in its capacity to identify the presence of pheasants in a broad and often complex landscape. Furthermore, it is the hunter that gets the pheasant, not the pointer dog.

In 1986, the project moved into a further phase of development with the award of a large research grant from the Robert Wood Johnson Foundation. This allowed the project to develop its influence more widely across the United States. In 1987, the project included 40 acute hospitals collecting data on 10 inpatient indicators (box 1).

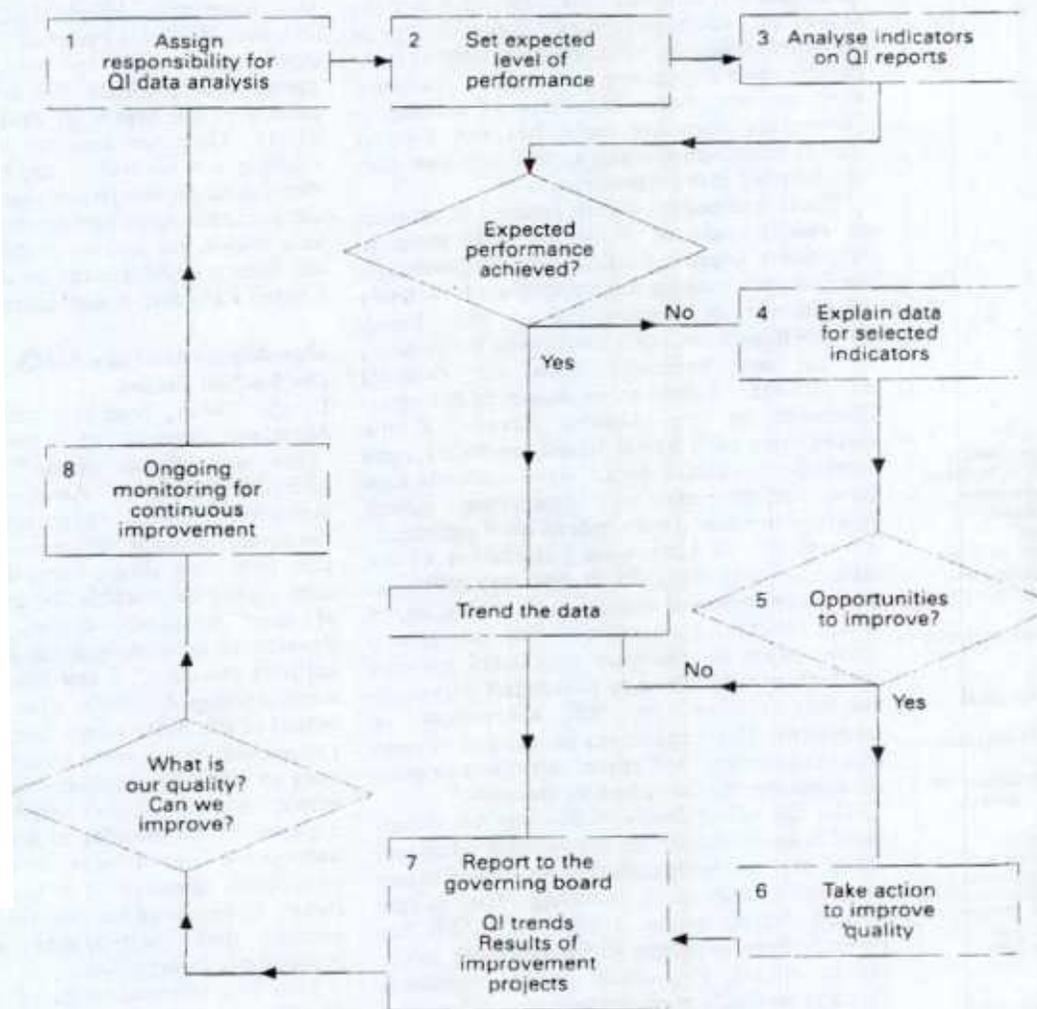


Figure 1. The approach to analysis of and response to indicator data suggested in the MHA QI Project.

INPATIENT INDICATORS (IMPLEMENTED IN 1986)

- 1 Hospital acquired infections
- 2 Surgical wound infections
- 3 Inpatient mortality
- 4 Neonatal mortality
- 5 Perioperative mortality
- 6 Caesarean sections
- 7 Unplanned readmissions
- 8 Unplanned admissions after ambulatory procedures
- 9 Unplanned returns to an intensive care unit
- 10 Unplanned returns to the operating theatre

OUTPATIENT OR DAY CASE INDICATORS

- A1 Unplanned return to accident and emergency within 72 hours
- A2 Patients in accident and emergency more than six hours
- A3 Discrepancy between initial and final reports on x ray films requiring a change in patient management
- A4 Patients leaving accident and emergency before completion of treatment
- A5 Cancellation of day case procedure on the day of the procedure

Box 1 Current indicators.

In 1996, the project includes over 1100 hospitals in the United States, as well as hospitals in the United Kingdom, Japan, and Canada. Subsequently, five outpatient and day case indicators have been developed and added to the system (box 1). During 1996, the MHA has also expanded the project into four other areas of performance assessment, developing indicators in psychiatric care, process of care, long term care and paediatric care. Box 2 shows a chronological development of the project.

In the United States, hospitals join the project as hospital groups (or systems). Participant hospitals in the project undertake to collect a selection of the 15 available indicators — it is not necessary to collect all indicators to participate. The indicators are collated at the level of the hospital as a whole, and data are input into specially designed software, which also incorporates the capacity for the hospital to display its own data graphically. The coded data are then forwarded to a system coordinator who collates the data from all of the hospitals in the local group. The collated data are then forwarded to the central office of the MHA QI Project in Baltimore on paper, on floppy disc, by email, or by an electronic bulletin board.

The MHA QI Project central office collates and analyses the data from all hospital systems and produces a standard report for each individual participant hospital. This quarterly report, which is fed back to the hospital within 45 days of the deadline for receipt of data, includes presentation of the hospital's own results in the context of the complete database of the project. This allows hospitals to benchmark their results against those from the project as a whole. The data are presented in

1985 Start of the MHA QI Project with indicators being piloted in seven Maryland hospitals

1987 Over 40 MHA hospitals collecting data for the inpatient indicators

1988 Grant from Robert Wood Johnson Foundation allowed project to expand throughout the United States

1991 Five outpatient or accident and emergency indicators introduced

1992 Northern and Yorkshire regional health authority join the project and the first United Kingdom hospitals participate

1995 Start of evaluation of project in United Kingdom hospitals

1996 Seven hospitals participating in the United Kingdom, over 1000 hospitals in 49 states participating in the United States plus hospitals in Canada and Japan

1996 Pilot of indicators for psychiatric care, paediatric care, long term care, and process of care

1996 Introduction of psychiatric indicator package

1996 United Kingdom office of the MHA QI Project (UK QIP) based in Newcastle launched in autumn 1996

Box 2 Chronology of the MHA QI Project.

terms of the project mean (SD) for each indicator and include the relative position of the participant hospital. A percentile distribution of rates is also tabulated showing the relative movement per indicator and hospital over time. Data are presented for the latest quarter and for the preceding three quarters, so that participants can compare their data over time as well as with other participants. Thus, hospitals have up to date and comparable data. Facilities exist for custom reports which enable locally defined analyses to be undertaken on the database. Furthermore, graphical software developed by the project is available to both hospital and system coordinators so that local comparative analyses can also be produced by the participants themselves.

In terms of the present debates about indicator comparisons, the MHA QI Project's strengths are seen to be:

- The validity of the indicators lies predominantly in their capacity to stimulate change and support quality improvement — in this they have been shown to be successful through the collation of case studies and through the involvement and continuing recruitment of hospitals to the project

- The validity is further assured through the participative development process which involved hospitals that would be the recipients and users of the data

- The reliability of the indicators is supported by clarity of definition and by regular reliability surveys undertaken by the project, with regular feedback and guidance to participants

- The nature of the project, which is non-judgmental in providing anonymised data

and in protecting the confidentiality of participants' data, leads to avoidance of some of the concerns about league tabling and the perversities that can arise from external judgements

• As a result, with the indicators being primarily used internally by participants, the issue of risk adjustment has been less prominent — the indicators require further local investigation and other quality improvement tools to create change. The need for explanation, by contrast with exploration, is reduced by the absence of public release of data.

MHA QI Project in the United Kingdom

At the time of implementation of the National Health Service (NHS) reforms in the United Kingdom, there was an interest in discovering whether other countries' systems of health care had implemented quality improvement methods from which we could learn. The NHS has had a mixed experience of the use of indicators. The development of the health service indicators package in the United Kingdom used routinely collected data from national NHS information systems.²⁰ This package, despite developing complex means of presentation, was widely criticised because the data were unreliable, dated (up to two years old when fed back), concentrated on structure and activity data, and were largely ignored by clinicians. The addition of a few "avoidable deaths indicators"²¹ to the package did little to assuage these concerns and evidence for the effectiveness and impact of the performance indicator or health service indicator approach is lacking. Indeed, there is a suggestion that the response to such data can be perverse.*

Thus in 1989, there were no recognised models for outcome based indicator measurement and use in United Kingdom hospitals that came close to meeting the need for measures that could effectively support quality improvement. The former Northern Regional Health Authority decided to evaluate the MHA QI Project model as one example of a successful (as measured by growth and encouraging case studies) and already developed system. It was thought that the advantage of linking with the MHA QI Project would include access to an already developed and tested system of data collection and feedback, access to predefined indicators with a history of user development, and access to the integral support mechanisms, including educational and investigative material. This would alleviate the need for new development of indicators and allow for more rapid assessment of the QI Project approach. It was decided that this would be a pilot project. Membership was limited initially to hospitals in the former Northern Region and the guidelines and policies of the American project were adopted unchanged. An associated programme of evaluation of action-oriented research was started. To support this the objectives of the United Kingdom project were derived in discussion with early participants (box 3).

<p>Improve the quality of care Improve data quality Encourage changes in clinical practice which improve quality of care Increase debate on quality between clinicians and managers Increase understanding of the concept of quality of care Stimulate discussion about data quality between clinicians and managers Encourage collaboration between hospitals participating in the project Maintain and encourage units to participate</p>
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Box 3 Objectives of the United Kingdom pilot project.

Currently, the MHA QI Project in the United Kingdom includes seven hospitals in the Northern and Yorkshire region, each at different stages in their involvement and each collecting a different number of indicators. As in the United States, there is currently a central coordinator for the seven hospitals and each hospital has its own project coordinator. These coordinators meet on a regular basis to offer support to each other and to new hospitals joining the project. A project steering group oversees the running and the development of the project. Membership of this includes project coordinators, clinical and managerial staff from participating hospitals, and local health authority representatives.

Effects of the MHA QI Project in the United Kingdom to date

The evaluation of the pilot project is currently half way through and initial findings have been reported back to the hospitals involved. Hospitals currently involved think that the MHA QI Project indicators are appropriate for their hospitals and are likely to produce positive change. There is increasing evidence of improvements due to involvement in the project. Initially the setting up and collection of indicator data led to improvements in data quality and information technology systems. Subsequently, issues raised during the examination of indicator data have led to improvements in quality of health care through modifications to current practice (boxes 4, 5, 6).

The evaluation has also clearly shown that there is a strong desire among participants to be able to compare their performance within a United Kingdom database of hospitals, and that the inclusion of more United Kingdom hospitals would strengthen the use of the project. There was also a demand for a central office that can provide more local support and guidance for participants than that at present provided from a distance by the Maryland office.

Way forward in the United Kingdom

The initial experience in the north east of England suggests that this model is applicable in the United Kingdom. Indeed, it has been suggested that usefulness is the best test of the validity of the indicators — that is, for the MHA QI Project it lies in the fact that hospitals

Hartlepool General Hospital is a 357 bed acute district general hospital in the north east of England serving a population of about 150 000. It was the first hospital in the United Kingdom to join the MHA QI Project in 1990. The hospital already had a well organised infection control system, but the development and collation of the infection indicators gave a further boost to their effectiveness.

One example of the impact arose from a presentation by the hospital infection control sister of data from the hospital infection control indicator (indicator 1). The pathology department, was able to detect a high incidence of cannula site infections. In a multidisciplinary peer review meeting involving nurses, and senior and junior medical staff, she was able to highlight this problem which was contributing to the acquired infection indicator. Ensuing discussion showed concerns that many intravenous cannulas that were being inserted on emergency admission were not used and remained in situ for prolonged periods. As a direct result, in November 1994, nurses on one ward decided to undertake an audit over two weeks.

Fifty six per cent (24/43) of emergency admissions had cannulas inserted shortly after admission. Only 46% (11/24) were used, of which 64% were used on day one only and only 18% for more than two days. Cannulas stayed in place for a median of two days with a range of one to nine days (mean 3.8 days, 5.2 if used and 2.8 if not). These results were presented by the nurses to an audit (quality assurance) meeting of the clinical staff of the medical specialty. As a result, it was agreed that nurses would be given discre-

tion to remove cannulas after 24 - 48 hours if they had not been used.

A repeat audit in August 1995 showed that the proportion of cannulas inserted on day one had fallen from 96% to 76%, and the number used had risen to 56% (fig 2). Most importantly, the duration of time in situ fell considerably to a new median of one day (range one to four) with a mean of 1.8 days (1.9 if used, 1.7 if not used).

This occurred as a direct result of scrutiny of hospital acquired infection indicators. This not only led to improvement in measures of use of intravenous cannulas, and associated reduction in patient discomfort and risk of infection, but also acted as a stimulus to generate a multidisciplinary forum for debate of clinical practice and to initiate a nurse led audit of practice.

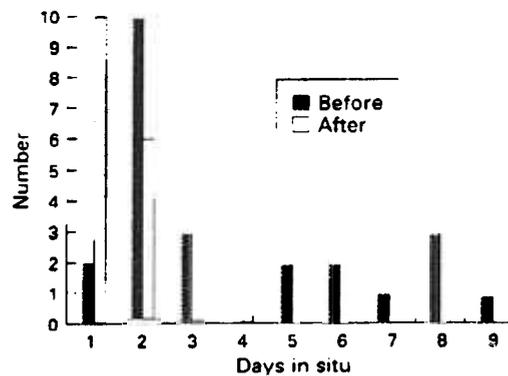


Figure 2 Graph of the number of cannulas and the duration of time in situ before and after a change in policy caused by a nurse led audit.

Box 4 Case study 1: hospital acquired infections and intravenous cannulas. Reprinted with permission from: *Journal of Quality Improvement*. Oakbrook Terrace, IL: Joint Commission on Accreditation of Healthcare Organizations, 1996:489.

across the United States and in different countries have used data from the same indicators to modify the processes of care and have shown improvements in the subsequent indicator rates and in other measures of quality of care.

As a result of this experience, funding has been obtained for three years from the MHA and the NHS Northern and Yorkshire Region to set up a United Kingdom office for the Maryland project (UK QI Project). This office, which will be based at Newcastle University, will employ a central coordinator and clerical support. Its main functions will be to promote the project within the United Kingdom, encouraging more hospitals to participate while maintaining and expanding support for hospitals already participating. The intention is to create a UK QI Project by adapting the MHA QI Project, modifying certain aspects of it, but most importantly enabling interpretation of the data in the light of United Kingdom comparisons and quality systems such as clinical audit.

The production of comparative United Kingdom data is currently being developed. This will help to meet demands from those

who think that United Kingdom healthcare indicator data cannot be directly compared with those in the United States. A national quality indicators conference is also planned for spring 1997.

The annual cost of participation for new United Kingdom entrants will be £2500 in 1996/7. Also, participants will need to identify a staff member. This will usually be a member of the clinical audit and quality department, who will take on the function of project coordinator, supporting and advising on data collection, liaising with the United Kingdom office, and facilitating use and feedback of data within the hospital. This person will be well supported by the United Kingdom office in terms of guidance, advice, and training.

All these developments will help strengthen the MHA QI Project position within the United Kingdom and enhance the potential gains participating hospitals can expect to receive.

Conclusions

The assessment of quality in hospitals had been a more prominent feature of United

North Tees general hospital is a 682 bed acute district general hospital in Stockton, Teesside, in the north east of England. North Tees joined the MHA QI Project in 1993. A case study shows the value of analysing and acting upon indicator data.

North Tees opened its new day case unit after joining the QI Project. The MHA QI Project coordinator was thus able to work closely with day case unit staff as the unit was being planned and set up. This permitted the data to construct the relevant QI Project indicators to be built into the routine data collection profile from the opening of the unit. Thus, data were immediately available for departmental quality improvement projects, as well as the QI Project. The rate of cancellation of ambulatory procedures on the day of the procedure (indicator A5) seemed high due to patients cancelling on the day or not attending for their procedure.

As a result patients who would require a general or local anaesthetic were requested to either attend a preadmission clinic or contact the day case unit about two weeks before their admission date. Patients were informed that failure to do so would lead to the cancellation of their operation and reallocation of their place on the operating list to another patient. This simple intervention led to dramatic reductions in the rate of patients failing to attend (fig 3). Furthermore, as they were replaced the available operating lists were also fully used, with consequent reduction in waiting lists.



Figure 3 Rates of non-attendance before and after intervention in North Tees General Hospital day case unit.

Box 5 Case study 2: reducing unplanned cancellation of day case procedure on the day of operation.

States health care than of that in the United Kingdom until the recent NHS reforms. Perhaps the most prominent and widely recognised approach is that of external accreditation of hospitals by the Joint Commission on Accreditation of Health Care Organisations, which has been in place in the United States since the early part of this century.²²⁻²⁴ This approach is largely dependent on assessment of structures and processes, leading to concerns that the accreditation process may answer the question "Can this hospital provide high quality care?" without considering the question "Does this hospital provide high quality care?"

Perhaps one of the main challenges to the accreditation model lies in the application of the external judgmental system within a continuous quality improvement model. The Joint Commission on Accreditation of Health Care Organisations have recognised this within their own programme of development and their clinical indicator project. None the less, the nature of the model remains that of external judgement. The MHA QI Project, as a support project for internal non-judgmental use of indicators, has gone from strength to

At Hartlepool General Hospital, the department of obstetrics and gynaecology has been particularly active in using the QI Project indicators to support quality improvement.

For example, they reviewed their caesarean sections (indicator 6) when the local monthly rate was 17%, 32/184 (compared with their annual average rate over two years of 15%, 566/3764), which, despite being considerably lower than many American participants, was still thought worthy of assessment. Case note review was chosen to try and determine avoidable factors. A high proportion were found to be after failed induction of labour (7/32, 22%). It became apparent that the three consultant obstetricians in the department did not have a consistent approach to selection of patients for induction of labour. Guidelines were not in place in the speciality. As a result guidelines were developed, based on the Cochrane database on effective practice in childbirth. These were implemented and are kept under continued review in quarterly multidisciplinary departmental meetings. In subsequent case note reviews the proportion of caesarean sections after induction of labour had fallen (5/51, 10%).

The same speciality also discovered that their unplanned readmission rate (indicator 7) after vaginal hysterectomy (predominantly operative) was 7% (11/153). This compared unfavourably with a published rate of 4%. Review of the case notes showed that only three cases of readmission were deemed to be unavoidable. The remaining cases could have been dealt with and reassured without need for admission.

After this 53 consecutive unplanned readmissions to the obstetrics and gynaecology speciality, not limited to hysterectomy cases, had their case notes reviewed and it was thought that many were avoidable, 10 (19%) of which were admitted during the night. A policy review showed that patients were admitted directly to beds and then seen by junior doctors that is, admission preceded review. New policies were introduced, including preadmission review by junior doctors which allowed discharged postoperative patients to be referred to the next available clinic or next morning ward review, thus reducing nocturnal referral and admissions. Between November 1995 and February 1996 12 patients, who would previously have been admitted were referred and dealt with in this way.

Box 6 Case studies 3 and 4: guideline development and policy review.

strength in the United States — from its beginnings as a pilot project involving seven hospitals to a nationwide project incorporating over 1100 hospitals. Other countries including the United Kingdom have recognised its potential and joined this increasingly popular

method for healthcare quality improvement. Interest has been expressed from other countries including Australia, Switzerland, Portugal, Austria, Belgium, and The Netherlands.

In the United Kingdom, participating hospitals have already begun to reap the benefits of involvement in the project, showing improvements in data quality and information technology systems, and by having a tested system that allows them to assess their current quality of health care, stimulating them to modify practice where needed. With local comparisons, hospitals can compare their indicators with others, safe in the knowledge that the MHA QI Project is an internal tool and their data will not be used to assess them externally.

For the project to be successful in the United Kingdom, the emphasis is on growth and increasing participation from other United Kingdom hospitals. With the establishment of the UK QI Project, this will become increasingly possible as the project is promoted and other hospitals begin to realise the potential benefits of participation. The United Kingdom office will also provide these new hospitals with the support needed to become established, while giving continuing support to those already involved.

The MHA QI Project is an important initiative and we are now in a position in the United Kingdom to take full advantage of this. If we do, there is the potential for a timely, reliable, and comparable national system for internal quality improvement which has so far been lacking in this country.

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