

Key Indicators

HIS/ICNA/DoH Working Group, 2001 –2003

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Introduction

In November 1999, an NHS document entitled “Controls Assurance Standards for Infection Control”⁽¹⁾ was issued to all Acute NHS Hospitals in England.

The process of Controls Assurance is designed to provide evidence that NHS organisations are doing their reasonable best to manage themselves, in order to meet their objectives and protect patients, staff, the public and other stakeholders against risks of all kinds.⁽²⁾ The document covers 21 key areas, from Health and Safety to the Built Environment.

The Infection Control section lists 15 criteria. NHS Trusts are expected to assess themselves against these standards, demonstrating evidence of continuous year-on improvement in their scores.⁽¹⁾

Criterion 13 states that “Key indicators capable of showing improvement in infection control and /or providing early warning of risk are used at all levels of the organisation, including the Board, and the efficacy and usefulness of the indicators is reviewed regularly”. However, the indicators were not initially defined, and it is only in more recent versions (Controls Assurance, 2003) that examples of indicators are provided.

A consensus meeting organised by the Hospital Infection Society in the autumn of 2000 on “Risk Management and Infection Control” identified that the lack of clarity on the role, interpretation and application of key indicators was one of the difficulties facing infection control and risk management teams.

In an attempt to produce some guidance, representatives from the Hospital Infection Society (HIS), the Infection Control Nurses Association (ICNA), the Association of Medical Microbiologists (AMM) and the Department of Health (England), debated these problems in 2001. A discussion document was presented to the HIS/ICNA joint Spring Symposium (2002) and made available for comments on the Societies’ web sites (www.his.org.uk).

Following a distillation of these discussions, a Working Group reconvened in 2003, and reconsidered earlier findings. This paper presents a summary of our deliberations, provides suggestions for key indicators for infection control, and presents a mechanism for their performance management.

Definitions

Indicators are used extensively as tools for assessing the efficiency, effectiveness, reliability and completeness of management systems

Numerous definitions of indicators from different countries and health care organisations have

been proposed. As shown in Table 1, they emphasise different aspects of the management assessment process, and can lead to confusion regarding their interpretation and application.



- Australian Council for Healthcare Standards
 - Measure of the clinical management and outcome of care. ⁽³⁾
- Canadian Council
 - “Flags” used as guides to monitor, evaluate and improve quality of care. ⁽⁴⁾
- Joint Commission Accreditation of Health Organisations
 - Monitors outcomes as a function of performance. ⁽⁵⁾

Table 1: Some definitions of performance indicators

It is important to recognise that key *management* indicators (usually based on financial or operational monitoring arrangements) are not the same as key *clinical* indicators (i.e. those that provide clinicians information of clinical progress or outcome), and it is also necessary to distinguish between *performance* indicators and *risk* indicators. Risk indicators are generally more proactive; they focus on the causes of adverse outcomes and help to identify vulnerabilities before the problems occur. Performance indicators on the other hand tend to focus on results achieved. They measure outcomes, and can be used to monitor progress.

Types of Indicators

For the purposes of this work, at least four different types of indicators have been identified.

1. Structure indicators usually identify how closely national and/or local organisational rules are being followed. They have also been called compliance indicators, and are usually evidenced by internal policies and guidelines that reflect compliance with statutory requirements.
2. Process Indicators indicate how people in the organisation follow internal rules and guidelines, how they avail themselves and acquire knowledge of these rules and guidelines, and how they apply them. Observational audits of specifically stated organisational requirements (such as hand hygiene activities following patient contact) are examples of process indicators. Detailed records of the number of people who have access to, or attend, internal training courses on guideline implementation are also recognised tools to assess a process indicator.
3. Outcome indicators link a risk indicator to the progress of patients. They measure the performance of the organisation against certain standards. As most Trusts do not routinely carry out extensive post-discharge surveillance, examples appropriate to infection control would be inpatient healthcare associated infection (HCAI) rates, such as urinary tract infection in catheterised patients, alert organisms and surgical site infections in clean surgery.

There is a natural tendency for clinicians to favour these types of indicators, since they reflect their clinical experience and expectations. However, outcome indicators are only useful for measuring trends or responses to interventions within the same Hospital. They are unlikely to serve as a useful tool in benchmarking or inter-hospital comparisons, since patient population, caseload mix and clinical and sampling practices will vary from site to site. Nevertheless, they will allow hospitals to assess themselves against their own established base lines, and should and could act as “flags” or “trigger points” for further action when results fall outside agreed limits of acceptability.

Rates of surgical site infection (SSI) in clean surgery was considered as a possible outcome indicator. There are problems with this, as it is clear that a range of underlying risks affect infection rates in surgery. However, it is widely accepted by surgeons, microbiologists and infection control teams, managers and patients and their families, that infection rates in clean elective surgery should be low. In the context of risk management and clinical governance, there is a case to be made for all surgical units to routinely assess and report their own SSI rates in clean surgery. These rates can be used to identify where action is needed, and then to monitor the effectiveness of interventions.

In the first instance, and because of resource constraints, we propose that SSI surveillance should be targeted. Individual Hospitals and Infection Control Teams should identify, through internal risk assessments, areas where infection rates are known or suspected to be high, and concentrate surveillance in these areas.

4. Surrogate indicators attempt to relate actions to effects. As the name suggests, these represent “proxy” markers of activity or outcome. Their relationship to the activity measured needs to be very clear and explicitly defined at the outset, and possible confounders identified.

Attributes of indicators

In order to determine their relevance, accuracy and usefulness, key indicators should be checked against a set series of criteria or “attributes”.

Essential or desirable attributes of indicators were discussed by the NHS Executive in 1998 and by the Australian Council for Healthcare Standards in 1999, and are listed in Table 2.















Attributes of indicators	NHSE 1998 ⁽⁶⁾	ACHS 1999 ⁽⁷⁾
Important		
Valid/Attributable		
Usefulness		
Definable		
Readily Available		
Reliable/Robust		
Identifiable		
Meaningful		
Responsive/Potential to improve		

Table 2: Essential attributes of Indicators

Any consideration of indicators should include a step-wise check against these attributes.

Key indicators for infection control may be chosen to reflect local needs identified by local risk assessment, or nationally to reflect national requirements and priorities; in the latter case the indicators may be externally imposed. They each have advantages and disadvantages, as shown in Table 3.

Table 3: National vs Local Indicators. Advantages and disadvantages

	Advantages	Disadvantages
National	<ul style="list-style-type: none"> - Benchmarking - Clarity of purpose - Agreed set data - Common denominator - May help to identify effective interventions 	<ul style="list-style-type: none"> - League tables - Time/resource expensive - Concentrates on externally imposed aims, ignores others
Local	<ul style="list-style-type: none"> - Based on local risk assessment - Information aligned to local objectives - Areas for data collection vary over time 	<ul style="list-style-type: none"> - Ignores national requirements - Data usually not sufficient for validation/evaluation
Combined	<ul style="list-style-type: none"> - “Best of both worlds” 	

Suggested Key Indicators for Infection Control

The 2003 Joint Working Group identified several potential key indicators for infection control locally and nationally. All the indicators proposed were tested against the “essential attributes” described in Table 2, and found to meet most of the necessary criteria.

a) Structure indicators.

Three structure indicators are suggested:

- 1) Audit of Performance against DH commissioned Guidelines ⁽⁸⁾
- 2) Ratings of Performance against West Midlands audit tool criteria ⁽⁹⁾
- 3) Audit of Performance against any national/local guidance for use of prophylactic antibiotics

b) Process indicators.

Three process indicators are proposed:

- 1) Audit of attendance at Infection Control educational activities
- 2) Audit of compliance with internal (Trust’s/Hospital’s) policies and guidelines for Infection Control
- 3) Observational audit of hand hygiene

c) Outcome indicators.

1) Alert Organisms/Alert Conditions

Although we believe data on alert organisms/conditions are routinely gathered by most IC Teams in the UK, it may be impractical to collect extensive information on all alert organisms and alert conditions. We suggest the following may be considered useful “*key alert indicators*”:

- *Clostridium difficile* diarrhoea (to become mandatory in England from 2004)
- MRSA colonisation rates/hospital acquisition
- Gentamicin resistant Gram negative organisms (e.g. *Klebsiella* sp)
- Penicillin resistant *S. pneumoniae*
- *Acinetobacter* sp in ITU.

2) Surgical Site & other HCAI Rates

The Healthcare Associated Infection Surveillance Steering Group (HAISSG) has already identified clean orthopaedic surgery as a target practice for SSI surveillance. This has been piloted across the UK from 1st April 2001, and will become mandatory in England from April 2004. Other areas of clean surgery that might be considered are femoral vascular surgery and cardiac artery bypass surgery.

While bacteraemia rates, especially MRSA bacteraemias, (which has been mandatory in England since April 2001) have been put forward as outcome indicators, this Group proposes that a more useful and more focused indicator would be MRSA /MSSA bacteraemia rates related to

the use of CVCs or in ITU/High Dependency Units, or to surgical site sepsis.

d) Surrogate (or Proxy) indicators.

As discussed previously, surrogate indicators require careful agreement on the definitions to be used and on the denominator data to be collected. The surrogate indicator must be a robust and reliable measure of the targeted parameter.

- 1) **Handwashing/ use of disinfectants/Use of antimicrobials**
The consumption of hand hygiene materials can be used as a surrogate indicator of effective compliance with hand washing requirements. Excessive use may indicate inappropriate use of materials (e.g. for other purposes), or excessive unrealistic concerns about transmissibility/cross infection. Under use may reflect poor compliance with local guidelines.

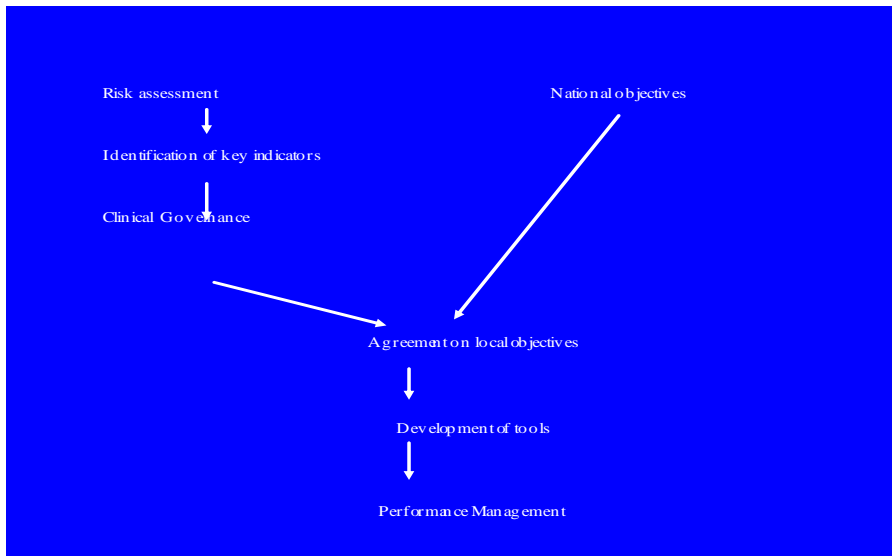
Similarly, prescription of oral vancomycin or metronidazole can be used as a surrogate indicator of the management of *Clostridium difficile*, or the use of glycopeptides a surrogate indicator of the incidence of serious MRSA infections.

Information collected by the Patient Experience and Public Involvement (PEPI) team at the National Patient Safety Agency (NPSA) links with infection control performance indicators alongside the reporting of adverse incidents associated with infection. This helps provide practical solutions to problems such as hand hygiene⁽¹⁰⁾.

- 2) Length of stay due to Hospital Acquired Infection (HAI), and death due to HAI were also given consideration as potential surrogate indicators. While the data may not be easily collectable, and there are difficulties with attributing either extended stay or death to a single cause such as HAI, it is recommended that these surrogate indicators should be investigated for their potential to identify key areas for further risk assessments.

Performance monitoring

The process of identifying key indicators should go through several stages. It has already been suggested that an internal risk assessment should be carried out as a first step. Based on this risk assessment, key indicators can be developed, based on the models discussed. A performance monitoring process should then be implemented to assess the effectiveness of hospital infection practice, prevention and control.

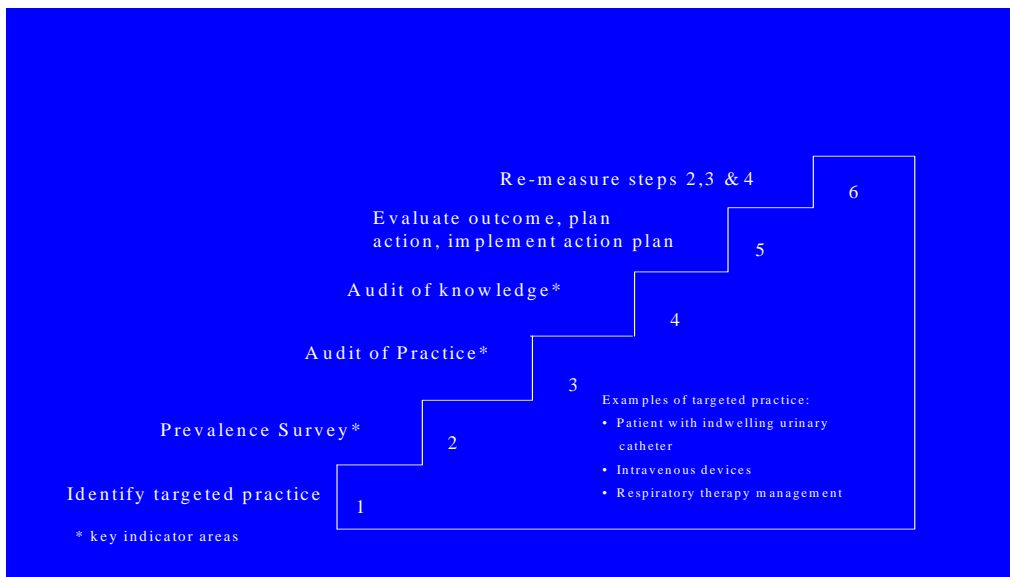


Use of key indicators in the Performance management process

A continuous monitoring process will identify whether infection control practice and outcomes accord with local and national standards.

Suggested framework for performance monitoring ⁽¹¹⁾

Audit activities that assess compliance with statutory requirements or nationally



agreed standards can be used to assess structure and/or process indicators

In many cases, these audit tools are still embryonic, but there are good examples already in extensive use in England and Wales such as the powerful tool for the assessment of ward standards developed by the West Midlands Nursing Group/ ICNA ⁽⁹⁾.

While these are examples of audit results used as key indicators, tools developed to assess and measure knowledge of compliance against nationally accepted standards can also be used as an indication of internal quality performance, and could

effectively be linked to other measurements such as outcome data to provide evidence of progress. The recently published document “Winning Ways”⁽¹²⁾ lays down essential practical criteria of hazard analysis of critical control points by which infection can occur and unambiguous adherence criteria are laid down for urinary catheters, intravenous lines, respiratory support and decontamination.

Suggested targeted practices are audits of the DH commissioned guidelines for urine and vascular catheterisation (published in the Journal of Hospital Infection⁽⁸⁾), audits of ward hygiene and environmental cleanliness,⁽¹³⁾ and audits of community acquired control of infection guidelines⁽¹⁴⁾ (e.g. re: enteral feeds).

When standards are not achieved, or under performance is noted, these indicators can help identify and implement appropriate corrective measures, thus closing the cycle.

Conclusions:

The process of Controls Assurance is a powerful tool in quality improvement. “Meaningful performance indicators are desirable in facilitating improvement and reducing risk. All Trust/clinical departments should be engaged in development and use of key indicators for their own internal performance but they should also maximise the value of such measures by comparing themselves against like organisations. Measuring performance is merely the first step in benchmarking, which involves using the insights provided by meaningful data to identify high performing organisations and learn from them.”⁽¹⁾

The guidance issued by the Chief Medical Officer (CMO) of England & Wales on March 2003 stated that clinical governance considerations need to be an integral part of any Controls Assurance statement. The identification of key indicators in Infection Control is not a simple task. In this paper we have outlined the processes required to design appropriate key indicators, and made some practical suggestions for use in infection control.

We encourage Infection Control Teams to investigate the use of some of these indicators and report their results so that others may learn from their experiences.

2002 – 2003 Working Group:

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Acknowledgements

Material in the definitions of Controls Assurance and indicators, and Tables 1 & 2 are gratefully acknowledged to K Donovan from the Controls Assurance Support Unit (CASU). The Group wishes to thank Jeff Tynan and the Yorkshire Group of the ICNA for allowing use of their “Background Discussion paper”, and the West Midlands ICNA Group and Team for permission to quote their Ward/Environmental Audit Tool.

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