The Performance Assessment Tool for Quality Improvement in Hospitals

(PATH Project)

A general description

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FOR QUALITY IMPROVEMENT IN HOSPITALS

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# Table of content

1. Framework, conceptual model and operational model .................................. 3
2. Material and methods .......................................................................................... 7
   2.1 The process for indicator selection is summarized here-under: 7
   2.2 Literature reviews 8
   2.3 Survey in eleven countries 9
3. Final set of indicators to measure performance ............................................. 10

Descriptive sheets for PATH core set Clinical effectiveness and Patient safety indicators ........................................................................................................... 15
Descriptive sheets for PATH core set Efficiency indicators ................................. 49
Descriptive sheets for PATH core set Staff orientation indicators ..................... 68
Descriptive sheets for PATH core set Responsive governance indicators ......... 88
Descriptive sheets for PATH core set Patient centeredness indicators ............. 93

Table 1 : Dimensions which are associated (either reflective or formative) with the indicator ........................................................................................................... 111

Table 2 : Example of the dashboard of the PATH project ................................. 114
1. Framework, conceptual model and operational model

For this project, an international panel of experts agreed on the following definition of hospital performance.

“A satisfactory level of hospital performance is the maintenance of a state of functioning that corresponds to societal, patient and professional norms. High hospital performance should be based on professional competences in application of present knowledge, available technologies and resources; efficiency in the use of resources; minimal risk to the patient; responsiveness to the patient; optimal contribution to health outcomes. Within the health care environment, high hospital performance should further address the responsiveness to community needs and demands, the integration of services in the overall delivery system, and commitment to health promotion. High hospital performance should be assessed in relation to the availability of hospitals’ services to all patients irrespective of physical, cultural, social, demographic and economic barriers.”

It highlights that performance is a multidimensional construct. Six dimensions of performance were identified: clinical effectiveness, efficiency, staff orientation, responsive governance, safety, patient centeredness. Safety and patient centeredness are two transversal perspectives that cut across all dimensions of performance (figure 1). For instance, patient safety (e.g. medication errors) is a safety perspective on clinical effectiveness and staff safety (e.g. occupational injuries) is a safety perspective on staff orientation. A specific conceptual model was designed for each dimension. Each model highlights sub-dimensions and how the dimension relates to other.

For each dimension and sub-dimensions, a number of indicators is pre-selected. An operational model is built on those indicators by specifying each indicator to which indicators it relates to and the rationale of the expected relationship. This operational model is crucial as it demonstrates that indicators cannot be interpreted in isolation.

To conclude, the conceptual model relates dimensions and sub-dimensions between each other while the operational model relates indicators and explanatory variables between each other. The conceptual model is translated into an operational model when indicators are fitted into it.

Both the conceptual and the operational model are components of a framework for performance assessment. This framework builds on the conceptual (“what do we measure?”) and on the operational model (“How do we measure it?”) and make sense by specifying the objectives of the project (“why do we measure”) and by incorporating tools to translate measurement into assessment and actions.
for quality improvement ("how can the measures be used?"). The PATH system was designed as a quality improvement tool (rather than an accountability tool). Its logical model is illustrated in figure 2.
Figure 1: The Theoretical Model of Hospital Performance

- Clinical Effectiveness
- Efficiency
- Staff Orientation
- Responsive Governance
- Safety
- Patient-centeredness
Enable strategic choices
- focused choices on priority areas

Provide technology support
- reliable, valid, timely, useful data
- reference points
- interpretative data

Promote cultural change
Values of
- Quality & Improvement
  - adaptability and change
  - individual and collective learning
  - collective responsibility
  - trust
- Patient centeredness
- Staff orientation

Promote structural change
- participation
- empowerment
- information sharing
- decentralized decision-making

Decisions should be evidence-based: informed by practices and knowledge

Care should be
- safe
- effective
- patient centered
- timely
- efficient
- equitable

Employees should have high satisfaction and morale

Practitioners should be enabled to make changes

A unique conceptual model of performance
Comprehensive / multidimensional, Integrated, Contingent / interpretative, Open to various data sources

Figure 2: PATH logical model
2. Material and methods

The selection of indicators was done following a pattern – selection of indicators – review of the literature – experts' comments – redefinition – that was repeated until a final consensus was reached. In addition to experts' comments, a survey was done in 11 countries. The survey served to assess 1) prevalence and potential for improvement, 2) burden of data collection, for potential indicators.

2.1 The process for indicator selection is summarized hereunder:

2.1.1 Development of a conceptual model for performance assessment and identification of dimensions and sub-dimensions of performance based on:

a. WHO policies;
b. review of the scientific literature to identify definitions and models of performance assessment
c. determination of performance dimensions during the 1st workshop and of subdimensions and definitions during 2nd and 3rd workshops.

2.1.2 Selection of performance indicators

a. review of performance assessment systems (Guisset et al. 2003 a, c);
b. elaboration of criteria for indicator selection (Guisset et al. 2003 b, c);
c. pre-selection of indicators based on expert judgment during the second workshop (WHO Regional Office for Europe 2003b);
d. review of the gray and scientific literature to complete the list of indicators in dimensions and sub-dimensions not properly covered by current performance assessment systems;
e. review of the scientific literature to assess prevalence, potential for use, validity, and reliability of pre-selected indicators;
f. survey in 11 countries to assess importance and relevance and burden of data collection;
g. elaboration of descriptive sheets summarizing the evidence on each preselected indicator;
h. selection of indicators for each dimension, based on review of the literature and survey results, by experts, using a nominal group technique, during third workshop (WHO Regional Office for Europe 2003b);
i. final selection of indicators to ascertain face, content, and construct validity of the set of indicators as a whole, by experts, during fourth workshop (WHO Regional Office for Europe 2003b).
The criteria for indicators selection are,

- at the level of the set of indicators, face validity, content validity, and construct validity
- at the level of indicators, importance and relevance, potential for use (and abuse) and sensitivity to implementation
- at the level of measurement tools reliability, face validity, content validity, contextual validity, construct validity, burden of data collection

In this background paper, we provide evidence for each pre-selected indicator and measurement tool on those criteria. Validity of the set of indicators at dimension level is shortly discussed in the conclusion. The framework for indicators assessment is described in more details in a previous document (Guisset et al. 2003b, c).

### 2.2 Literature reviews

Several reviews of the literature took place at different points in time.

A first selection of indicators was based on initial screening of indicators used in current performance assessment systems. This resulted in an extremely large list (background papers for the 2nd workshop on performance assessment, Guisset et al, 2003a and c).

This list was reviewed for content validity of the set as a whole at first instance. Additional reviews of the literature were done to complement dimensions or subdimensions for which no indicators were identified previously. Some of those additional indicators were found in assessment project limited in scope, for one very specific dimension of performance assessed or only at one point in time. Others were developed for research project and could be considered as experimental.

Then, a review of the scientific literature was performed for each indicator, to provide evidence on its validity. Importance and face validity were also assessed through a research on internet. Medline and Current Contents databases as well as web sites of the major organizations doing research on performance assessment or assessing dimensions of hospital performance were used. For several indicators, extremely well done reviews of the literature were available (e.g. clinical effectiveness indicators recommended by the Agency for Healthcare Research and Quality Inpatient Quality Indicators). Due to very limited time frame, we strongly based our descriptive sheets recommendations on those reviews and did not retrieve all the “first-hand” papers.
2.3 Survey in eleven countries

The objective of the survey was to make sure that selected indicators were in line with future users’ perception of their importance and usefulness (i.e. degree hospital impact on the indicator and relevance to the context), and burden of data collection (i.e. availability of data, ease of access, data quality).

Twenty-five countries were contacted through the Health Promoting Hospitals network, for most of them. Answers were received from Albania, Belgium, Denmark, Estonia, Finland, France, Georgia, Germany, Ireland, Lithuania, Slovakia. Individual respondents or large working groups filled one questionnaire for each country. Ad-hoc survey questions had been developed for each dimension. The questionnaire covered areas such as main database and links between database, indicators currently used, and evaluation of proposed indicators against the criteria of usefulness, importance, data availability, ease of access and data quality.

Generalization of results of the survey are limited because 1) the sample was identified from a self-selected group through the Health Promoting Hospital network), 2) “social desirability” bias, 3) low number of respondents by country.

Detailed description of the results of the survey is out of the scope of this paper. They were presented during the workshop to the participants and used to support their final decision on which indicators to incorporate and whether they should be considered as “core” or “tailored” indicator.
3. Final set of indicators to measure performance

This third part presents the consensus of the final set of indicators follow by their own descriptive sheets, provided separately for each dimension of performance. However, clinical effectiveness and safety are examined jointly.

Following descriptive sheets, table 1 presents dimensions which are associated (either reflective or formative) with the indicator. We also present the relations among indicators.

To conclude, we present an example for the dashboard of the PATH project. Each sheet corresponds to one indicator (or one tracer when applicable). In our example (see table 2), it is « Readmission within 30 days for the acute myocardial infarction ». Note that results are dummies.

Each sheet has three sections :

- On the left, we present the global rate with its confidence interval (when possible) and the N which corresponds to the denominator of the global rate, followed by stratified results (if available).
  
  Global rate : 9,11%
  CI : 2,32%
  N : 593

- In the middle, the graph shows the global rate for the hospital with its confidence interval (first column; 9.11%).

  This is followed by the rate of the peer group. Each hospital will decide its peer group (e.g. comparison with all other university hospitals in the PATH project, or with hospitals who have the same catchment’s area, etc.). We have two columns for the peer group, the crude rate (5.1%) and the adjusted rate (6.2%) (if we can calculate it).

  The next two columns represent the national rate (crude and adjusted). The national rate corresponds to the mean of all hospital in the PATH project who come from the same country.

  The last column represents the hospital’s objective for this indicator. Each hospital will decide its own objective (in our example, 5%).

  These 6 columns are only for one period and could be reproduced each year in the future to show trends.

- On the right, we present dimensions which are associated (either reflective or formative) with the indicator. We also present the related indicators.
Clinical effectiveness and safety

1. Appropriateness of care
   - Caesarean section delivery

2. Conformity of processes of care
   - Prophylactic antibiotic use for tracers: results of audit of appropriateness
     a. Colorectal scheduled surgery
     b. CABG
     c. Hip replacement

3. Outcomes of care and safety processes
   - Mortality for selected tracer conditions and procedures
     a. AMI
     b. CAP
     c. CABG
     d. Hip fracture
     e. Stroke
     f. Total hip fracture
   - Readmission for selected tracer conditions and procedures
     a. AMI (30 days)
     b. CAP (30 days)
     c. Asthma (24 hours)
     d. Asthma (24-72 hours)
     e. Diabetes (24 hours)
     f. Diabetes (24-72 hours)
     g. Hysterectomy (30 days)
     h. Total hip replacement (30 days)
   - Admission after day surgery for selected tracer procedures
     a. Cataract surgery
     b. Cholecystectomy
     c. Knee arthroscopy
     d. Inguinal hernia
     e. Curretage of uterus
     f. Tonsillectomy/adenoidectomy
     g. Tube ligation
     h. Varicose veins
   - Return to higher level of care (e.g. from acute to intensive care) for selected tracer conditions and procedures within 48 hours
   - Sentinel events
Efficiency

1. Appropriateness of services
   - Day surgery, for selected tracer procedures
     a. Cataract surgery
     b. Cholecystectomy
     c. Knee arthroscopy
     d. Inguinal hernia
     e. Curetage of uterus
     f. Tonsillectomy/adenoidectomy
     g. Tube ligation
     h. Varicose veins

2. Productivity
   - Length of stay for selected tracers
     a. Uncomplicated delivery
     b. Hysterectomy

3. Use of capacity
   - Inventory in stock, for pharmaceuticals
   - Intensity of surgical theatre use
     a. Elective
     b. Emergency

4. Financial performance
   - No indicator in core set

Staff orientation and staff safety

1. Economic factors
   - No indicator in core set

2. Practice environment
   - No indicator in core set

3. Perspective and recognition of individual needs
   - Training expenditures

4. Health promotion and safety initiatives
   - Expenditures on health promotion activities

5. Staff experience
   - No indicator in core set
6. Behavioural responses
   • Absenteeism
     a. Short term
        a. Nurses
        b. Nurse assistants
     b. Long term
        a. Nurses
        b. Nurse assistants

7. Staff safety
   • Percutaneous injuries
   • Staff excessive weekly working time

Responsive governance and environmental safety

1. System integration and continuity
   • Average score on perceived continuity items in patient surveys

2. Public Health Orientation: access
   • No indicator in core set

3. Public Health Orientation: Health promotion
   • Breastfeeding at discharge

4. Equity and ethics
   • No indicator in core set

5. Environmental concerns
   • No indicator in core set

Patient centeredness

1. Overall perception/satisfaction
   • Average score on overall perception/satisfaction items in patient surveys

2. Interpersonal aspects
   • Average score on interpersonal aspects items in patient surveys

3. Client orientation: access
   • Last minute cancelled surgery
      a. One day surgery
      b. Inpatient
4. Client orientation: amenities
   • No indicator in core set

5. Client orientation: comprehensiveness
   • No indicator in core set

6. Client orientation: information and empowerment
   • Average score on information and empowerment items in patient surveys

7. Client orientation: continuity
   • Average score on continuity of care items in patient surveys
Descriptive sheets for PATH core set Clinical effectiveness and Patient safety indicators

A descriptive sheet was drawn for each proposed indicator. The descriptive sheets contain an operational definition, the rationale and justification for use (burden, importance/prevalence/potential for improvement, hospital impact, and validity and a guide for interpretation (direction and potential target, stratification and alternative measures, related performance indicators, causative factors, and potential quality improvement strategies).

The indicator on sentinel events follows a slightly different presentation.

As descriptive sheets should be self-standing, each sheet contains its own bibliography.

Sheet 1: Mortality, for selected tracer conditions or procedures
Sheet 2: Readmission, for selected tracer conditions or procedures
Sheet 3: Readmission to higher level of care within 48 hours
Sheet 4: Caesarean section
Sheet 5: Admission after day surgery, for selected tracer procedures
Sheet 6: Antibiotic prophylaxis use, for selected tracer procedures
Sheet 7: Sentinel events
Clinical effectiveness: Mortality, for selected tracer conditions and procedures

a. Definition

a. Numerator:
   Core basket: Total number of patients admitted for a specific tracer condition or procedure who died during their hospital stay
   Tailored basket: Total number of patients admitted for a specific tracer condition or procedure who died during a fixed follow-up period

b. Denominator: Total number of patients admitted for tracer condition or procedure

c. Tracer conditions and procedures: stroke (to be restricted to very specific ICD-9 and ICD-10 codes to increase homogeneity of case-mix), Acute Myocardial Infarction (AMI), hip fracture, community-acquired pneumonia (note: depends on the level of severity, for simplicity of data collection, includes patient in intensive care units), Coronary Artery Bypass Graft (CABG) (note: not relevant in all hospitals), Total hip replacement
   Maternal and neonatal mortality are included in a tailored basket for use in South Africa
   Tracer condition is identified using only the principal or primary diagnosis code

d. Exclusion criteria: patients transferred to/from other hospitals
   Transfer rates and – ideally – destination should be reported simultaneously as a proxy for case-mix and for reputation
   For acute myocardial infarction, it might be interesting to specifically study for patients transferred in (i.e. patients referred to tertiary care hospitals from lower level hospital) (in tailored set?)

e. Risk-adjustment: AGE, SEX

b. Rationale – Justification for use

Specific detailed justifications for use of mortality rates for coronary artery bypass, acute myocardial infarction, stroke, congestive heart failure, hip fracture and hip replacement, pneumonia and perinatal mortality is presented at annex 1. They are summarized at table 1.

a. Burden: Mortality is the “ultimate” outcome.

b. Importance – Prevalence – Potential for improvement:
   Readmission rates vary greatly depending on disease and time frame. Low mortality rates are often a major concern for statistical reasons. In rare events, it is difficult to distinguish between random noise (“chance”) and differences in quality or case-mix. To identify statistically significant differences in problem rates of the size likely to be due to quality often requires either more cases or bigger differences than are present. A simulation study – assuming perfect adjustment for case-mix – demonstrated there are perhaps only one or two surgical diagnoses (carotid endarterectomy and coronary artery bypass grafting) that have both the high volumes and substantial mortality necessary to be considered useful mortality rates.

c. Hospital impact:
   - For instance, in a study before-after design with concurrent controls, quality improvement interventions lowered the risk of in-hospital deaths among patients with acute myocardial infarction.
   - However, hospitals cannot impact on pre-admission care. Pre-admission care is crucial in conditions such as acute myocardial infarction and strongly impacts on severity on admission and final outcome.

d. Validity:

| Reflects technical quality of care |
| Is affected by length of stay |

Strong rationale: The use of effective treatment should save lives and treatments themselves should not cause untimely death. Mortality is the “ultimate” outcome; mortality as outcome is not difficult to explain to people.

High face validity: Despite the challenge of risk-adjustment and proper specification of the outcome, this indicator is probably the most widely used indicator of quality. Mortality rates were the first hospital-
Clinical effectiveness: Mortality

Specific outcome measure to be made publicly available by the Health care Financing Administration (HCFA) in 1986. I raised a general outcry and the HCFA ended their publication. Despite numerous study documenting the limitations of mortality rates for consumer use, mortality rate have recently been made publicly available in Scotland, England, France, and Ontario.

**Mixed evidence supporting construct validity:**

Association with other indicators of performance:

- **Mortality rates:** In one study, risk-adjusted mortality rates for 6 common conditions (acute myocardial infarction, congestive heart failure, pneumonia, stroke, obstructive lung disease, gastrointestinal hemorrhage) are very weakly associated. Random variations and low hospital volume accounted for some of the difference in standardized mortality ratios. This observation contradicts the assumption that if mortality rates represent hospital quality of care they should be similar for different diagnosis, particularly diagnoses that would be managed by similar doctors or nurses.

- **Process of care:** Hospitals identified as providing good process of care for AMI and for pneumonia tend to have lower mortality rates.

- **Patient satisfaction:** Patient satisfaction and mortality rates for 6 high volume medical diagnoses – at the hospital level – were found to be inversely associated. In this study, association was the strongest for scores between mortality rate and patient’s ratings of coordination, discharge instructions, overall quality, information provided and was almost nil between mortality rates and patients’ ratings of physician care.

- **Accreditation:** In one study, hospitals not surveyed by JCAHO had on average higher mortality rates than hospitals accredited by JCAHO but there were considerable variations in mortality rates within hospitals accredited by the JCAHO.

**Strength:** strong rationale, death is the “ultimate” outcome, demonstrated relationship with process measures for some conditions

**Limits:** rating is strongly affected by risk adjustment procedure, time frame and whether or not deaths after discharge are included; low reliability (concerns with quality of coding).

**c. To add meaning – Guide for interpretation**

**Core indicator:** very limited risk-adjustment

Potential value: stimulate discussion and encourage local investigation

<table>
<thead>
<tr>
<th>Screening tool</th>
<th>X</th>
<th>Conclusive assm</th>
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**Tailored indicator:** extensive risk adjustment and fixed follow-up period (extends beyond discharge)

<table>
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<tr>
<th>Screening tool</th>
<th>X</th>
<th>Conclusive assm</th>
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**a. Direction and targets:** Lower rate is preferred.

**b. Stratification – alternative measures:**

**Stratification**

- **Place of occurrence:** operating theatre, intensive care/intermediary care unit, hospitalization unit

**Complementary measures:**

- **Mortality rate after fixed follow-up**

**Proportion of death occurring within hospital compared to deaths after discharge**

Mortality rates should always be presented simultaneously with transfer rates and destination.

Complementary measures for further scrutiny – to investigate outliers: implicit or explicit review **process of care** in medical records to assess the compliance with guidelines. Process indicators have been
Clinical effectiveness: Mortality

extensively used to assess the quality of care to acute myocardial infarction, stroke and pneumonia patients.

c. Related performance indicators:

- Length of stay (efficiency)
  Expected relationship (for core):
  When lengths of stay are shortened and patients are prematurely discharged, a larger proportion of patients might die after discharge and hence will not be computed in the core indicator, artificially lowering mortality rate.

- Return to the ICU (Core – clinical effectiveness)
  Expected relationship: Return to the ICU is associated with an increased risk of mortality.

- Ventilatory-associated pneumonia (Tailored – safety)
  Expected relationship: Ventilatory associated pneumonia is a serious complication and reflects quality of care in the intensive care unit. As both indicators are supposed to reflect the same underlying concept, they should be positively associated.

d. Causative factors:

Mortality rates are affected by many factors other than quality of care. Differences may be attributed to the following factors:

1. Differences in coding practices
   - Some diagnosis have a low specificity/sensitivity (e.g. stroke)
   - Differences in ranking of procedure: chronologically or according to the degree of complexity
   - Under- or over-reporting of secondary comorbidities
   - Unable to distinguish between comorbidities present on admission from those developed during the hospital stay

2. Differences in risk factors and selection bias
   - Variation in propensity to hospitalize (for community-acquired pneumonia)\(^{10}\)
   - Variation in pre-admission care (for acute myocardial infarction and for stroke) and severity on admission
   - Concurrent illness, complexity of procedure, frailty and functional capacity (for hip fracture)
   - Socio-economic status\(^{11}\)

3. Differences in transferring and discharging practices (for inpatient mortality)

4. Differences in post-discharge care (for mortality within a fixed followed-up time period)

5. “Chance” (stochastic factor)

6. Quality of care

Implication for performance assessment:

- Factor 1 (coding practices) is under hospital influence but not related to quality of care. Data quality mechanism should be established in order to evaluate the extent of differences in coding practices. A short description of who collects the data and by who and why it is used can give some insights into potential incentives and coding strategies. Meta-indicators on data quality (e.g. average number of secondary diagnoses) should be computed.

- Factor 2 (risk factors and selection bias) is an exogenous variable; it mostly out of hospital’s control. Ideally, mortality rates should be adjusted for risk factors. Due to the high burden of data collection, adjustment for risk factor is not required in the core set. To limit impact of differences in risk factors, we advise to limit comparisons to peer groups of hospitals with similar case-mix (e.g. community hospital, tertiary hospitals). Potential proxies for risk factors: age, sex, admission origin (home, nursing home), average income in zip code of residence. More specific proxies are discussed for each tracer condition or procedure in the appendix.

- Factor 3 (transferring and discharging practices) is under hospital’s control and affects patient case mix. It is not related to quality of care. We propose to exclude in the core set all patients admitted from another hospital or discharged to another acute care setting. In-hospital mortality rates should always be presented simultaneously with transfer rates, discharge destination, and length of stay.
Clinical effectiveness: Mortality

- **Factor 4 (post-discharge care)** is only partly under hospital’s influence. Hospitals’ role, autonomy and integration within the community vary greatly among the national or regional contexts. Factor 4 is only relevant for mortality rate within a fixed follow-up period (in tailored basket). Impact of exogenous environmental factors is lessened with short follow-up period (e.g. 30 days).

- **Factor 5 (“chance”)** will never be neutralized but it should be accounted for when comparing results. Test of statistical significance need to be computed.

Hospital factors (partly under hospital control depending on hospitals autonomy in the country):

- **Equipment/technology available**, e.g. revascularisation facilities for AMI patients.

- **Staff ratios** and staff qualifications:
  - A large-scale study (more than 200,000 general, orthopaedic and vascular surgery patients in 168 US hospitals) indicates that each additional patient per nurse is associated with a 7% increase risk in dying within 30 days of admission.
  - Specialty of admitting physician

Environmental factors:

- **Cultural factor**: Preference to discharge end-of-life patients home or to a palliative care facility will alter the in-hospital / out-of-hospital ratio of mortality.

- e. **Quality improvement strategies**:

In this section, hospitals should describe how mortality is monitored and how key outcome and process indicators are used in a quality improvement process. Strategies include physician profiling, peer review committee, death analysis by internal committee, etc.

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4. AHRQ
Clinical effectiveness: Mortality rate – Appendix

Detailed presentation of potential tracer conditions for mortality rate indicators is mostly based on an extensive review of the literature by the AHRQ\(^1\) and on work by the CRAG\(^2\). The full reports are available on


**Coronary artery bypass**

**Face validity and consensus on use:**

- **Rationale:** Relatively common procedure that requires proficiency with the use of complex equipment and technical errors may lead to clinically significant complications
- **One of the most widely used and publicized post-procedural mortality indicator.** Prominent public initiatives to compare patient outcomes for doctors and hospitals often started with CABG surgery. Currently used by the ACHS, MarQIP, NHS-T. It has become the focus of State Public reporting initiatives (California, New Jersey, New York, and Pennsylvania).

**Construct validity:**

- Many technical processes of care as well as surgeon and hospital skill and experience have been shown to reduce mortality
- Evidence indicates some effect of volume and surgeon experience on CABG mortality.

**Risk-adjustment:**

- Well-documented risk factors (cardiac function, coronary disease severity, urgency of the surgery) and data on risk factors partially available in administrative database.
- Ranking relatively insensitive to which method is used to perform risk-adjustment (AHRQ).
- Measures derived from ICD-9-M codes and basic demographic information proved superior in identifying patients’ risk of dying to clinical measures (e.g. physiology scores after the acute physiology score component of the Acute Physiology and Chronic Health Evaluation, third version)\(^3\)

**Limits:**

- Distinguishing comorbidities present at admission from complications of care

**Acute myocardial infarction**

**Prevalence:**

- The concern of the World Health Organization for the current coronary heart disease epidemic is substantiated by its MONICA project (multinational MONItoring of trends and determinants in Cardiovascular disease).

**Potential for improvement:**

- Many acute treatments have been shown to reduce short-term and long-term AMI mortality and many are believed to be under-used, suggesting important opportunities for quality improvement
- Though, a European study\(^4\) indicated average quality ratings (adherence to five key treatments) ranged from 89% in the U.K. and France to 96% in Germany. Those high ratings suggest little room for improvement.

**Hospital impact:**

- Interventions to improve adherence to published guidelines significantly decrease mortality rates\(^5\)

**Face validity:**

- Currently used by CRAG, JCAHO
- A consensus has emerged about the definition of timely and effective treatments for AMI. We do not propose such indicators for use in the PATH project because of the burden of data collection on a
Clinical effectiveness: Mortality rate – Appendix

regular basis. However – for hospitals flagged as “outliers” – mortality indicators could be coupled with process indicators to try to understand or substantiate the results. This is an interesting feature of AMI mortality indicators

Construct validity:
- Hospitals identified as providing good process of care for AMI also tend to have lower mortality rates

Limits:
- Variation in AMI risk factors across hospitals. AHRQ suggests selection bias is less important for AMI – an urgent medical condition – than elective surgical conditions. However, according to the CRAG, hospitals are concentrating patients of different severity because of:
  1) Influence by the speed at which patients get to the hospital after a heart attack: sicker patients make it to the hospital in urban areas though, in rural areas, they would have died before getting to the hospital because of poor access; but an alternative analysis would suggest that the faster the patients get to the hospital the more chance he has to survive (so favoring urban areas)⁶
  2) Influence by the type of policy adopted to ensure early thrombolytic treatment (e.g. ‘scoop and run’ policy in urban areas to get the patients as quickly as possible to the hospital and pre-hospital thrombolysis in rural areas)
- Proxy for those “environmental” factors (urban/rural area, % deaths following AMI occurring out of hospital in the area, average survival rate in the area, etc.) should be considered during the pilot test.
- Many hospitals treat a relatively small number of AMI patients. Thresholds for inclusion (minimum number of case to be able to distinguish noise from signal) need to be defined.

Complementary indicators for further scrutiny – to investigate outliers:

Process indicators based on audit of medical records to evaluate compliance with guidelines:
- Percent of AMI patients without aspirin contraindications who received aspirin within 24 hours before or after hospital arrival
- Percent AMI patients without betablocker contraindications who received a beta blocker within 24 hours after hospitals arrival
- Thrombolytic treatment:
  - Definition JCAHO: Median time from arrival to administration of a thrombolytic agent in patients with ST segment elevation or left bundle branch block on the electrocardiogram performed closest to hospital arrival time
  - Definition ACHS: Number of patients with AMI requiring thrombolysis who receive thrombolytic treatment within one hour of presentation to the hospital / total number of patients with AMI requiring thrombolysis.
    Patients are supposed to require thrombolysis if (1) chest pain greater than 30 minutes, (2) new ST segment elevation or left bundle branch block
- Median time from hospital arrival to percutaneous transluminal coronary angioplasty (PTCA) in patients with ST segment elevation or left bundle branch block (LBBB) on the electrocardiogram (ECG) performed closest to hospital arrival time

Stroke

Prevalence and potential for improvement
- The AHRQ reports in-hospital mortality rates from 10% to 15% of cases.
- In one international study⁷, proportion of patients who died at six months range from 12% to 33% and differences in mortality rates between countries remained very large after adjustment for casemix at baseline. Authors warn that residual differences are too large to be solely explained by differences in quality of care.

Rationale:
Clinical effectiveness: Mortality rate – Appendix

- Like for AMI, process indicators (appropriate and timely care) are widely available for stroke and could be used to examine flagged hospital in a benchmarking approach.

Limits: CRAG and AHRQ identify two major limits for stroke indicators related 1) to coding practices and variations in definition and 2) to patient selection bias and case-mix:

- As part of the preparatory work for the Five Hospital Study of Stroke Outcome (Dennis et al. 1999 in CRAG), three ICD-9 codes were excluded because they were insufficiently accurate markers of acute stroke. During the study itself, acute stroke in the discharge abstract was confirmed 78% of the time. This result was confirmed in Denmark with 79.3% of stroke recorded in discharge abstract confirmed after medical record review. The AHRQ reports a positive predictive value of less than 80% for new strokes associated with the diagnosis codes included in the stroke DRG.

- Hospitals with different types of facilities may attract different types of patients with resulting different outcomes. For instance, the presence of a trauma center or accident and emergency facilities may involve the admission of a higher proportion of patients with more severe stroke; an interest in acute stroke therapies may attract patients with milder or resolving symptoms; the presence of a large elderly unit may attract patients of greater frailty with a worse prognoses; and finally, specialist centers may attract a higher proportion of the more complex and unusual cases but not those who are severely ill and unfit to transfer. At some hospitals, “best practice” involves treating mild patient on an outpatient basis and are consequently admitting a more severely ill subset of patients (AHRQ).

- Hospitals may not only differ in their admission but also in their transfer and discharge practices for patients suffering from uncomplicated strokes or transient ischemic attacks (AHRQ). This difference in transferring and discharging practices is thought to strongly influence in-hospital mortality rates because most deaths occur many days to weeks after the attack.

- Patient selection bias calls for adequate measurement of patient risk-factors. Acute stroke mortality is determined primarily by stroke severity. Patient factors – when measured with a comprehensive battery of case-mix variables– account for many of the differences in observed outcomes. In the International Stroke Trial, outcomes were adjusted for sex, age over 70 years, systolic BP over 160 mm Hg, presence of atrial fibrillation, neurological deficits, entered within 24 hours of onset and visible infract on CT scan. On aggregated national data, adjustment for case mix had a serious impact on ranking of the countries. Unfortunately, few data are available on a routine basis and it would require ad-hoc review of medical records.

Congestive heart failure

Prevalence and potential for improvement:

- Common condition with relatively frequent inpatient mortality.

- Recent studies show a decline in case fatality rates – possibly related to recent innovations in the care of hospitalized patients.

- Hospitals vary widely in processes of care known to reduce CHF mortality.

Construct validity:

- Related to mortality for some other medical conditions. Hospital organization of care (stroke unit care versus stroke team care) is somewhat associated with mortality rates; stroke unit management being beneficial only to patients with large vessels infarcts.

Limits:

- Differences in coding practice of CHF is suspected because a primary diagnosis of CHF is not very sensitive in administrative data, though little evidence exist to support the importance of this problem.

Complementary indicators for further scrutiny – to investigate outliers:

Process indicator based on audit of medical records to evaluate compliance with guidelines:

- Percentage of heart failure patients with documentation in the hospital record that left ventricular function (LVF) was assessed before arrival, during hospitalization, or planned for after discharge.
Clinical effectiveness: Mortality rate – Appendix

**Hip fracture**

Prevalence and potential for improvement:

- Hip fracture is a widely used tracer because of its high prevalence.

Limits:

- Very diverse case-mix of patients admitted for hip fracture. Hip fractures typically occur in frail patients at risk for deep venous thrombosis, pneumonia and myocardial ischemia.
- Many aspects of the case-mix which are strongly associated with the outcome cannot be measured on the basis of discharge abstracts, e.g. pre-existing levels of mobility or functional capacity, extremely frail patient with associated diagnoses such as dementia, etc.
- Low mortality rate and therefore low statistical significance (around 5%).
- Unclear time frame to relate death to previous hip fracture (1 month or 4 months?). Thirty-day mortality is considerably higher than in-hospital mortality.
- Construct validity at the provider level not established.
- Limited explicit evidence on practices that reduce short-term mortality.

Place of occurrence of the hip fracture (bedroom, elsewhere in the patient’s residence or outside the home) could be a good proxy for general functional status prior to hip fracture and a powerful predictor of subsequent outcome (CRAG). Alternatively, patients admitted from institutional care are likely to be frailer and with a poorer diagnosis than patients admitted from their home (CRAG). According to the AHRQ, comorbidities and functional impairment are important predictors. Comorbidities can be obtained from discharge data; while functional impairment requires prospective data collection but little evidence exists on whether this patient factor significantly differs across hospitals.

**Hip replacement**

Prevalence and potential for improvement:

- Common procedure frequently performed on older patients with comorbid illnesses
- Many technical process of care may reduce potentially life-threatening complications
- With mortality rates usually lower than 1-2%

Limits:

- Due to the low mortality rates, hospital level estimates may be imprecise for many hospitals. For instance, it would be necessary to include 4673 patients (corresponds to 20 years data for a hospital performing 230 interventions per year) to evidence a statistically significant difference in mortality between two hospitals whose rates are respectively 0.5 and 1%\(^{11}\). The lack of statistical power is a major limit for this tracer.

Complementary indicator for further scrutiny – to investigate outliers:

- See indicator on appropriateness of antibiotic prophylaxis

**Community-acquired Pneumonia**

Prevalence and potential for improvement:

- Hospitalizations for pneumonia are very common and in-hospital death is relatively common too.
- Average mortality rate for community-acquired pneumonia of 13.6% in hospitalized patients, with higher rates for elderly patients (17.6%), bacteremic patients (19.6%) and patients admitted to intensive care units (36.5%)\(^{12}\). For this condition, the most important concern is the heterogeneity of pneumonia patients.

Construct validity:

- Three processes of care (blood culture collection within 24 hours of arrival or administration of antibiotics within 8 hours of arrival, initial treatment with second or third generation cephalosporin)
Clinical effectiveness: Mortality rate – Appendix

are independently associated with reduced 30-day mortality\textsuperscript{13,14}. Malone and Shaban\textsuperscript{15} demonstrated in 330 patients with community-acquired pneumonia that patients treated inconsistently with the American Thoracic Society Guidelines had a 4.43-fold increase risk of inpatient mortality and had significantly longer length of stay.

- Those results were not confirmed by a more recent study\textsuperscript{16}. The diverging results might be explained by confounding effect of severity of illness. Blood culture collection within 24 hours of arrival and antibiotics administration within 8 hours were significantly associated with severity of pneumonia on admission.

Limits:

- Literature suggests that differences in comorbidity and coding might affect performance measures and that risk-adjustment for comorbidities affects hospital ranking.
- The AHRQ indicates that substantial patient heterogeneity reduces precision of hospital estimates and that previous studies report a relatively high probability of errors in labeling hospitals as high-mortality outliers.
- Differences in admission practices (conditions for treating pneumonia patients an outpatient basis), could result in some hospitals admitting a more severely ill subset of patients.

Complementary indicators for further scrutiny – to investigate outliers:

Process indicators based on audit of medical records to evaluate compliance with guidelines:

- Median time from hospital arrival to administration of first antibiotic dose: assess the timeliness of antibiotic administration for pneumonia inpatients
- Percent of patients whose initial blood culture specimen was collected prior to the first hospital dose of antibiotics.
- Percentage of pneumonia inpatients 65 years of age and older screened for and/or given pneumococcal vaccination when needed.
- Percent of patients who receive oxygenation assessment within 24 hours prior to or after arrival at the hospital

Perinatal mortality

Perinatal mortality rate is used as an indicator of the quality of antenatal and perinatal care. The infant mortality rate has been identified as a key indicator for monitoring “progress towards Health for All by year 2000” by the WHO. Though it is a relatively well-defined indicator of the social and economic development, perinatal mortality rate is preferred to measure quality of perinatal care. During the 2\textsuperscript{nd} workshop, it has been identified by the panel of expert as “very important” indicator. Though, it is a very rare and extreme event. The very low frequency of this event seriously hampers statistical significance at the hospital level.


\textsuperscript{5} The effects of quality improvement interventions on inhospital mortality after acute myocardial infarction
Clinical effectiveness: Mortality rate – Appendix


9 Dennis M et al. A project to develop and test a system of monitoring the quality and effectiveness of hospital stroke services in Scotland by routinely measuring patient outcomes. Final report to the Chief Scientist Office, 29th March 1999 (in CRAG)


Clinical effectiveness: Readmission, for selected tracer conditions or procedures

1. Definition

a. **Numerator**: Total number of patients admitted through the emergency department after discharge – within a fixed follow-up period – from the same hospital and with a readmission diagnosis relevant to the initial care.

b. **Denominator**: Total number of patients admitted for selected tracer condition

c. **Tracer procedures and conditions**: acute myocardial infarction (30 days), community-acquired pneumonia (30 days), asthma (24 hours and 24 to 72 hours), diabetes (24 hours and 24 to 72 hours), hysterectomy, total hip replacement.

In the tailored set, a global indicator on surgery patients could be included (of specific financial interest for Poland because the second admission is not reimbursed).

South Africa will also include a specific indicator for HIV patients.

Tracer condition is identified using only the principal or primary diagnosis code

d. **Inclusion/exclusion criteria**: Patients who died during the index hospitalization or who were discharged to another acute care hospital are excluded from the numerator.

To be considered as a readmission, four conditions must be met: 1) diagnoses or procedure that was considered relevant to the initial care, 2) subsequent emergent or urgent admission (non elective), 3) the time between the discharge after the initial episode and the admission for the subsequent hospitalization lies within a specified time period defined by an expert panel, 4) the initial episode did not end with the patient signing himself out against medical advice (or died).

We propose to drop condition 4 because of the burden of data collection and – to some extent – it is hospital’s responsibility to encourage patients to stay as long as required. Second, a proxy for emergent or urgent readmission is to include only readmissions through the emergency department.

Other potential exclusion criteria: patients already receiving continuous care at a primary care clinic, chemotherapy or radiotherapy; residing in or planned to go to nursing home; admitted only to undergo a procedure. Those criteria are not used in the PATH core indicator but could provide interesting tracks for tailored indicators.

**Risk-adjustment**: It was decided by the working group not to adjust for difference in age or sex because it may represent bad selection of patients for day surgery.

2. Rationale – Justification for use

a. **Burden**: From a financial point of view, readmissions are often very costly as they involve the most expensive type of health services, inpatient acute care. From a patient perspective, they are distressing for the patient and relatives and often reflect major complications.

b. **Importance – Prevalence – Potential for improvement**: Readmission rates vary greatly depending on disease and time frame. For instance, asthma readmission rate within 7 days vary from 1.1% in the Netherlands to 3.0% in California; diabetes readmission rate within 7 days vary from 1.1% in the Netherlands to 3.0% in Scotland, congestive heart failure readmission rate within 30 days vary from 4.3% in New York to 13.0% in California, and rates for hip replacement within 30 days vary from 0.3% in Netherlands to 1.6% in Scotland. From 9% to 48% of all readmissions have been judged to be preventable because they are associated with indicators of substandard care during the index hospitalization and 12% to 75% of all readmissions could be prevented by patient education, predischarge assessment and domiciliary care.

c. **Hospital impact**: The efficacy of pre-discharge reviews and improved follow-up after discharge to reduce readmissions has been demonstrated in seven studies out of 11 review of the literature in 1999. In three cases, such strategies have simultaneously been associated with a decrease in mortality rates. The intervention had no effect in three studies and resulted in an increase in readmissions in one study. More recently, three prospective controlled trials indicated that there were fewer readmissions in the intervention group.
**Clinical effectiveness:**
**Readmission, for selected tracer conditions or procedures**

(nurse-led heart failure clinic and a multi-disciplinary home-based intervention). Around three quarter of
the hospitals participating to the Australian National Demonstration Program for best practice in elective
surgery decreased readmission rates and overall, unplanned unbooked readmissions within a month of
discharge were reduced by 27%.

However, hospital influence is limited because readmissions after medical stay often indicate the
progression of the disease rather than discrete outcomes of care.

A central question is how much influence do hospitals have on post-discharge care and to what degree are
they accountable for post-discharge care? Answers to this question may vary greatly depending on
national arrangements and organization of care.

By focussing on early readmissions and imposing more stringent time frame for readmission, impact of
natural progression of the disease and post-discharge care is limited. For instance, for chronic disease
such as asthma and diabetes, we advise to use readmission within 72 hours.

d. **Validity:**

| Reflected technical quality of care (CE) |
| Reflect discharge preparation (RG), follow-up (RG) and patient education (RG & PC) |
| Is affected and affects length of stay (Eff) |

Readmission may reflect on different aspects of care depending on the type of tracer condition (chronic
disease, medical condition or surgical procedure) and the time frame. For instance, asthma readmission
within 24 hours indicates premature discharge, between 24 and 72 hours indicates poor patient education
and within 30 days indicates quality of ambulatory care.

**Strong rationale:**
Readmissions reflect the impact of hospital care on the condition of the patient after discharge. The
underlying assumption to use early readmission as a quality indicator is that something providers did or
left undone during the prior stay or early post-discharge period led to the need for the patients’
rehospitalization. It could be either due to sub-standard care during index hospitalization (poor resolution
of the problem), either to poor discharge preparation or follow-up. This assumption is challenged by
natural progression of the disease, if readmission is planned or if it is prompted by a disease not present at
discharge and not related to the previous spell.

From an efficiency point of view, readmission is costly.

**High face validity:** There is a very large consensus for use of condition- or procedure- specific
readmission rates. The NHS, ACHS, the Maryland Quality Indicator Project and the Ontario hospital
Report currently use disease specific readmission rates. A consensus also emerged that global readmission
rates are of little value.

**Weak evidence supporting construct validity:** A meta-analysis of 13 comparisons of readmission rates
after sub-standard versus normative care and of 9 comparisons of readmission rates after normative versus
exceptional care (from 1993 to 1996) reveals that early readmission is significantly associated with the
process of inpatient care. Evidence of an association with premature discharge and poor process of is
stronger for community-acquired pneumonia. Evidence is mixed for congestive heart failure.

In one study, risk of readmission is increased with increased satisfaction with access to emergency care
assessed on the index hospitalization.

**Strength:** strong rationale (if limited to “unplanned” readmissions), very high consensus to use, ease of
understanding by providers.

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1. Dimension: Clinical Effectiveness
2. Dimension: Responsive Governance
3. Dimension: Patient Centeredness
4. Dimension: Efficiency
Clinical effectiveness: Readmission, for selected tracer conditions or procedures

**Limits**: difficult to distinguish preventable readmission from readmission due to the natural progress of the history or readmissions not liked with the previous spell or planned readmissions, weak construct validity, difficult to follow-up readmissions in different hospitals

3. To add meaning – Guide for interpretation

| Screening tool | X | | | Conclusive assumption |

Even after adjustment for risk factors, difference in outcome could be attributable to residual differences in case-mix, coding inconsistency, random error, etc.

Degree of conclusiveness varies greatly depending on tracer condition or procedure, time frame, risk-adjustment, identification of unplanned readmission.

a. **Direction and targets**: lower readmission rates are preferred.

b. **Stratification – alternative measures**:

To understand the indicator better, complement with:

- Proportion of readmissions **planned** for further treatment or follow-up **on total** readmissions.

For tracer conditions for which process indicators are developed (see JCAHO and ACHS), verify **compliance with guidelines** relating to post-discharge care. For instance,

- Percentage of heart failure patients discharged home with written discharge instructions or educational material given to patient or caregiver at discharge or during the hospital stay addressing all of the following: activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen. Each of the six discharge instruction elements can be assessed individually. However, completion of all six instruction categories is required for a patient to qualify as a numerator event for this measure

- Percent of patients without aspirin contraindications who are prescribed aspirin at hospital discharge

c. **Related performance indicators**:

- **Length of stay** (Core – efficiency)
  
  *Expected relationship*: If short length of stay reflects premature discharge, risk of readmission is increased. Moreover, shorter length of stay diminishes opportunities to educate the patient. On the country level, evidence indicates a there seems to be a country specific trade-off between length of stay and rate of readmission. But the same international study indicates that patients with longer index hospitalization are at increased risk of readmission. Length of stay may be a proxy for severity, frail status and complications.

- **Patient satisfaction or experience with information and education** (Core – Patient Centeredness)
  
  *Expected relationship*: As both early readmissions and patient survey scores on information and education are supposed to reflect –at least partly– the same underlying concept, they should be correlated negatively (higher readmission associated with lower satisfaction scores)

- **Discharge preparation** (Responsive Governance)
  
  *Expected relationship*: Effective screening and discharge planning has been shown to decrease the risk of readmission

- **Patient satisfaction or experience continuity of care** (Core –Patient Centeredness perspective on responsive governance)
  
  *Expected relationship*: Both indicators are influenced by the continuity and integration of care. As they shed different and complementary light on the same concept, they should be positively related.

- **Discharge letter sent to GP within 2 weeks** (Core –Responsive governance)
Clinical effectiveness:
Readmission, for selected tracer conditions or procedures

Expected relationship: We expect that some readmissions could be expected if the general practitioner support patient after return home.

d. Exogenous variables:
- Patient factors:
  - Severity of illness and comorbidities: current administrative database provide little information to evaluate the severity of illness, for instance left ventricular ejection fraction for congestive cardiac failure or forced expiratory volume for chronic obstructive airways disease\(^\text{18}\).
  - Socio-demographic variables e.g. supplemental Medicaid coverage, socio-economic status\(^\text{19}\)
  - Discharge destination (home or skilled care nursing facility or nursing home)
- Selection bias:
  - If there is no linkage with the registry of death, only inpatients deaths are excluded. Patients who die after return home are still computed in the numerator but will obviously not be readmitted.
  - If a high proportion of patients is treated on an outpatient basis, hospitalized patients have an increased severity
- Environment factors
  - Managed care penetration, after care by general practitioners, home care. Effectiveness of home-based intervention strategies\(^\text{20}\) and lower readmission rates for patients discharged to nursing homes or skilled care facilities indicate that post-discharge care has a strong impact on readmissions. Availability of alternative care resources may divert patients from readmission to hospital.

e. Quality improvement strategies:
In this section, hospitals should list strategies such as
- Guidelines on pre-discharge assessment, criteria for readiness for discharge
- Strategies to improve pre-discharge preparation, e.g. with nurse/social care worker team providing effective screening and discharge planning coordination of home care
- Increased cooperation with other care providers (e.g. general practitioners, home care services agencies)
- Scheduled follow-up appointments, diabetes or asthma clinics
- Patient brochures on how to care for the condition after return home, what are the symptoms to check for, whom to contact in case of concerns, etc.
- Day-hospital or hospital-at-home programs for specific conditions (e.g. congestive heart failure)

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Clinical effectiveness: Readmission, for selected tracer conditions or procedures


11 Kossovsky MP, Perneger TV, Sarasin FP, Bolla F, Borst F, Gaspoz JM. Comparison between planned and unplanned readmissions to a department of internal medicine. Journal of Clinical Epidemiology 1999;52(2):151-156.


Clinical effectiveness:
Readmission to higher level of care within 48 hours

1. Definition

a. Numerator: Total number of patients in the denominator who are unexpectedly (once or several times) transferred to a higher level of care (intensive care or intermediary care) within 48 hours (or 72 hours to account for week-end effect) of their discharge from a high level of care to an acute care ward
b. Denominator: Total number of patients in the acute care ward who were previously in an intensive care unit or an intermediary care unit and underwent an elective surgery
c. Exclusion criteria: Readmissions for further planned operations should be eliminated from the numerator (but difficult to identify with current information systems)
d. Risk adjustment: AGE, SEX
e. Comment: Several levels of intensive care are coexisting. It is therefore suggested to replace the term “intensive care” to “higher level of care” and to use acute care ward as reference points. The definition of “higher level of care” is left for local determination. The focus is not on patients entering the intensive care but the patients exiting the acute care ward to return to intermediary or intensive care.

2. Rationale – Justification for use

a. Burden: Patients readmitted to the ICU have 2 to 10 times higher risk of death and longer length of stay and odds of \(^1\). Increased risk of death remains after risk-adjusting or controlling for severity\(^2,3\).

b. Importance – Prevalence – Potential for improvement:
- The average readmission rate of 7% (range, 4 to 14%) has remained relatively unchanged in Both North America and Europe\(^4\). Readmission within 48 hours account for 22 to 30% of all readmissions to ICU.
- In a single site study\(^5\) (US, university hospital, 5 years period) only 97 patients (0.9%) discharged from the ICU were readmitted within 48 hours.
- In Australia, the average readmission rate within 48 hours is 1.5% (decile 2=0.75%, decile 8=1.9%) within hospitals using ACHS quality indicator
- We found no data on readmission rates in East European country. Prevalence rate above may not be generalized to those contexts because of wide variations in equipment available in ICU and use of ICU on the patient care pathway.

c. Hospital impact:
- We found no study relating experience of hospital intervention aiming at reducing readmission to ICU.
- If readmission reflects premature discharge, we expect hospitals to be able to impact on readmission by supporting discharge decisions. Hospital impact is limited by the availability of ICU beds.

d. Validity:

| Readmission to the ICU reflects technical quality of care in the ICU and more specifically of appropriate timing of discharge (CE\(^i\)). |
| To a lesser extent—as we limit indicator to readmissions within 48 hours time frame—it reflects technical quality of care in hospitalization unit (CE\(^ii\)). |
| It may also reflect, access to care (RG\(^iii\)) and optimal use of capacity (negative relationship) (Eff\(^iv\)). |
| Readmission to the ICU impacts on productivity (prolonged length of stay) (Eff\(^v\)) and outcomes of care (higher mortality rate) (CE\(^vi\)). |

\(^{i}\) Dimension: clinical effectiveness
\(^{ii}\) Dimension: clinical effectiveness
\(^{iii}\) Dimension: responsive governance
\(^{iv}\) Dimension: efficiency
\(^{v}\) Dimension: efficiency
**Clinical effectiveness:**
**Readmission to higher level of care within 48 hours**

**Mixed rationale:** Readmission occurring soon after ICU discharge is considered to reflect premature discharge and premature discharge was shown to be responsible for 22% to 42% of ICU readmissions. Concern for premature discharge has been raised because of steadily decrease in ICU length of stay and ICU bed rationing. The underlying assumption is that shorter length of stay is detrimental and increases risk for readmission. But, on the other hand, such practice also places patients at lower risk for iatrogenic complications. And, interestingly, patients readmitted to the ICU are those with longer initial length of stay even after adjustment for risk factors 6,7, and “we do not know whether continual ICU care would have avoided the clinical deterioration that prompted readmission”8. To reduce impact of evolution of the disease and quality of care in the hospitalisation unit and to focus on premature discharge, the indicator includes only return to ICU within 48 hours of discharge from ICU.

**Strong face validity:** It is a generally accepted and widely used indicator of quality in ICU. ICU readmission within 48 hours ranked by the Society of Critical Care Medicine’s Quality Indicator Committee (1995) as the top indicator for judging ICU quality. The ACHS and the Maryland Quality Indicator Project currently use this indicator.

**Low construct validity:**
- Evidence readmissions to the ICU within 48 hours reflect premature discharge is limited:
  - Readmission within 48 hours occurs in significant proportion of patient (22 to 30% of readmitted patients in three published studies9).
  - In a single site study10, only 32% of the readmissions within 4 days after ICU-discharge with any new or old pathology under insufficient control or insufficiently diagnosed were deemed preventable. This represent only 31 patients on a 4 years period in a 10 beds ICU. The other readmissions were due to unforeseeable complications of the underlying disease. The largest proportion of readmission deemed preventable was in the group with respiratory problems.
  - In a multi-site study in Austria, patients who oresented residual organ dysfuctions and were in greater need of organ support at ICU discharge had an increased risk of being readmitted11.
- Evidence readmissions to the ICU within 48 hours reflect quality of technical care within ICU is mixed:
  - In a meta-analysis of studies published before 1997, there is no evidence that hospital readmissions are correlated with the overall quality of the hospital12,13.
- Good evidence readmission to the ICU is associated with worse outcomes and more specifically with higher mortality rate, after adjustment or controlling for severity (see section “burden” above).

**Conclusion**

| **Strengths:** | widely accepted and used measure with strong face validity, limited burden of data collection |
| **Limits:** | low validity because of mixed rationale and mixed evidence of its relationship with other outcome measures and process, difficult to distinguish between planned re-operations and or natural evolution of the disease and readmissions due to complications or premature discharge, difficult to adjust for clinical factors (e.g. severity of illness), difficult comparisons between hospitals or countries because of varying levels of availability of ICU beds and intermediate care beds, difficult to interpret because of bi-directionality of the indicator, low prevalence and hence difficult to identify statistically significant differences |

3. **To add meaning – Guide for interpretation**

| **Screening tool** | X |
| **Conclusive assm** |

a. **Direction and targets:**
   Usually, lower rates are better. However, an extremely low rate may indicate systematic failure to discharge patients in a timely fashion resulting in prolonged ICU stays or failure to readmit patients with deteriorating health status. Prolonged length of stay should be avoided also from a financial point of view and from an access point of view in a context of limited ICU beds capacity. Hence, patients should be discharged when their need for further ICU care is low and not nil and hence with

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91 Dimension: clinical effectiveness
Clinical effectiveness:
Readmission to higher level of care within 48 hours

a small, but real, chance of returning. Both low and high rates need to be scrutinized. No target rate has been established.

b. Stratification – alternative measures:

Complementary measures:
- Readmission rate at 72 hours
- Readmission rate during hospital stay, notwithstanding any limit on time
- Proportion of deaths occurring within ICU
  • Expected relationship: higher proportion of death in hospitalization units indicates that patients are not transferred rapidly when their health status deteriorates. It may explain low readmission rates.

Measures for further scrutiny – to investigate outliers:
- Audit a sample of medical records stratify for reasons for readmission to ICU based: diagnosis or problem similar or identical to the reason for initial admission, pulmonary problems, including inadequate pulmonary toilet and nosocomial pneumonia, cardiac conditions, bleeding, medication toxicities
- Identify multiple readmissions

c. Related performance indicators:
- Complications (Core – Safety)
  • Expected relationship: complications may be one of the factors explaining high readmission rates. For example, nosocomial pneumonia that developed subsequent to discharge from ICU is a frequently reported reason for readmission to ICU. On the other hand, if readmission rates are extremely low –indicating late discharge from ICU– patients are exposed to an increased risk of acquiring ICU-related complications such as resistant nosocomial infections.

Readmission rates make sense only when analyzed simultaneously with the following indicators built on the same patient population:
- Length of stay in ICU (median, 1st and 9th decile)
  • Expected relationship: lower length of stay is associated with higher readmission rates if it reflects premature discharge but it is associated with lower readmission rates if it reflects faster recovery and less complications because of high quality of care
- Mortality rate within ICU/intermediate care unit/hospitalization unit
  • Expected relationship: higher mortality is associated with lower readmissions because of selection bias)

d. Exogenous variables:

Patient factors
- Selection bias: policies, practice style regarding admission to intensive care unit and beds availability
- Predictors of readmission not well studied nor reproducible
- Other predictors: age, severity of illness during the initial ICU admission, admission for upper gastrointestinal hemorrhage or neurological diagnoses, specific laboratory abnormalities, complications such as hospital-acquired pneumonia
- Medical patients are more likely than surgical patients to be readmitted. This factor should not influence the indicator because it is computed for specific tracer conditions. But it needs to be taken into account when aggregating results on various tracer condition (see hereunder questions to be addressed during 4th workshop)
- Measurement of risk factors require ad-hoc data collection

Hospital factors (partly under hospital control depending on hospitals autonomy in the country):
- Availability of ICU beds
  • Measure: average occupancy rate of ICU beds
- Availability of intermediate care beds
  • Measures: # intermediate care beds per ICU beds; occupancy rate of intermediate care beds
Clinical effectiveness:
Readmission to higher level of care within 48 hours

- Type of equipment/machinery available within ICU and within hospitalization units (e.g. monitoring and perfusion pumps)

e. Quality improvement strategies:

In this section, hospital should list strategies such as
- Improvements on very specific process of care such as careful neurologic assessment, meticulous attention to respiratory care transfer orders, prompt respiratory therapy on floor care
- Systematic readmission audits as part of a quality improvement program
- Guidelines for discharge decisions
- Improved collaboration between physicians and nurses in making transfer decision
- Improved coordination of care between ICU and hospitalization units
- Specific follow-up for patients discharged from ICU (e.g. dedicated teams of respiratory therapists)

7 Cooper GS, Sirio CA, Rotondi AJ et al. Are readmissions to the intensive care unit a useful measure of hospital performance? Medical Care 1999;37:399-408.
Clinical effectiveness: Caesarean section

1. Definition

a. Definitions
Three definitions were originally proposed to the working group:
Version A: Primary Caesarean section delivery rate  
**Numerator:** cases within the denominator with first time Caesarean section  
**Denominator:** includes first time deliveries; excludes day-surgery patients & general exclusion criteria
Version B: Vaginal delivery after Caesarean section  
**Numerator:** Number of vaginal birth in women with a diagnosis of previous Caesarean section  
**Denominator:** All deliveries with a previous Caesarean section diagnosis in any diagnosis field
Version C: Total Caesarean section delivery rate  
**Numerator:** Number of Caesarean sections  
**Denominator:** All deliveries

b. Comments:
Though version A is theoretically preferred be indicator because efforts to reduce C-section delivery should focus on reducing the number of primary C-section delivery, it was decided to include only version C in the core set of indicators, to simplify data collection. Version A is highly recommended in the tailored set of indicators.

A strong selection bias is expected. For instance, in France, three levels of maternity are defined and the proportion of C-section is expected to vary widely between those levels. It will be crucial to identify such structural differences to compare only maternity treating patients with similar complexity.

2. Rationale – Justification for use

a. Burden:
- **Negative impact:** C-section is associated with higher rates of mortality and morbidity: deep vein thrombosis, pulmonary embolism, post-thrombotic syndrome, endometritis and wound infections.
- **Positive impact:** Lower perinatal mortality, neonatal mortality, and serious neonatal morbidity for the planned Caesarean section group with specific conditions (foetus breech presentation); For subsequent delivery following C-section, reduce risk for maternal uterine rupture and neonatal trauma

For a financial point of view, C-section is more costly

b. Importance – Prevalence – Potential for improvement:
- C-section is the most common operative surgery in United States
- WHO targets a rate of 10-15%. In Nordic countries, the rate remains stable around this target while it steadily increased in United States, Canada, and United Kingdom
- Wide variations in C-section rates were observed and were not associated in with differences in perinatal and maternal mortality rates
- **France:** 16.3% in 1999 to 17.6% in 2001 (AUDIPOG network)¹
- **England:** 21.3% total, 17% primary C-sections and 67% repeat C-section, in 2000²
- **Scotland:** from 24% in 1998 to 20% in 2001³
- **Austria:** from 13% in 1996 to 15% in 1998 (17% in primigravidae)⁴
- **Denmark:** between 13.2% and 15.2% in five labour wards⁵
- Data above in Western European and North American contexts cannot be generalized to Eastern European countries without further evidence

c. Hospital impact:
- Experience of physician profiling and feedback proved useful to decrease C-section rates⁶,⁷,⁸,⁹
- BUT hospital is limited as, to some degree, patients’ preferences can intervene in the use of C-section
Clinical effectiveness: Caesarean section

d. Validity:

Reflects appropriateness of care, propensity to use invasive techniques, physician risk-aversion (Dim: CE – PS\textsuperscript{i}).

- Extremely low rates (typically, under 5\%) may reflect a lack of access to health care (Dim: RG\textsuperscript{ii}).
- Influences complications (PS\textsuperscript{iii}).
- Impacts on costs (Dim: Eff\textsuperscript{iv}).

**High face validity**: Very high consensus on use (mainly on primary C-section). C-section is one of the indicator most often used.

Indicators on C-section are included in the following performance assessment systems: Ontario, CRAG, ACHS, MarQIP, AHRQ, JCAHO. However, target rates are still somewhat controversial and hamper interpretation of the indicator. Debate is mostly centred on vaginal delivery following C-section.

**Low construct validity**:
- We found no evidence of association between C-section rates and other clinical effectiveness indicators, except for complications directly related to delivery (see section “burden”)
- Limited evidence of lower C-section rates at sites where there is consensual meeting with the clinician staff, either after each duty-call or weekly

Conclusion:
- **Strengths**: most common operative procedure (in US); evidence of over-use and large potential for quality improvement in a number of settings; evidence of large variations in use of C-section; huge consensus on use of the indicator (face validity); WHO target to reduce C-section rate from 22\% to 10-15\%.
- **Limits**: difficult interpretation (bi-directional); selection bias expected; need to identify high-risk patients for which C-section is indicated (not identifiable from administrative database); non-clinical (cultural, socio-demographic) factors and patient preferences difficult to account for.

3. To add meaning – Guide for interpretation

Version A – not adjusted for risk factors

| Screening tool | X | | | | Conclusive assm\textsuperscript{a} |

Version A with limited adjustment for risk factors

| Screening tool | | | | | X | | | | Conclusive assm\textsuperscript{a} |

a. **Direction and targets**: bi-directional indicator, both low and high rates should be scrutinized.

There is no agreement on what level the C-section rate should be.

In countries such as United States and United Kingdom, C-section has been identified as an over-used procedure and as such a lower rate is better. However, this may not be the case in all countries and in all hospitals. Great caution is especially required when interpreting the rate of vaginal delivery following C-section has no agreement because of the risk of performing. WHO targets to reduce C-section from 22\% to 10-15\%. In the US, Healthy People 2010 targets 15\% of women giving birth for the first time and 63\% of women with priori with C-section birth. Those rates are proposed at the national level and hospital specific targets may vary according to case-mix. They should serve only as reference points and not as norms that every hospital should attain.

b. **Stratification – alternative measures**:

\textsuperscript{i} Dimension: clinical effectiveness and patient safety

\textsuperscript{a} Dimension: responsive governance

\textsuperscript{ii} Dimension: safety

\textsuperscript{iv} Dimension: Efficiency
Clinical effectiveness: Caesarean section

Stratify C-section rates for deliveries at risk depending on complication type, dystocia, breech presentation, previous C-section, multiple pregnancy.

Background measures to better understand practice type:
- Proportion of elective (before labour) versus emergency C-section deliveries
- Proportion of failed vaginal delivery after C-section
- Epidural use
- Labor induction

Complementary measures for further scrutiny – to investigate outliers:
- Proportion by category of urgency (immediate threat to the life of the mother or fetus, maternal or fetal compromise that is not immediately life threatening, mother need early delivery but no maternal or fetal compromise, delivery timed to suit the mother and the staff) (classification according to the National Confidential Enquiry into Perioperative Deaths NCEPOD)

Background measure to evaluate potential impact of C-sections: maternal and neonatal complications

c. Related performance indicators:
- Maternal and perinatal mortality rate (not included as indicator in the core neither in the tailored set of because of very low occurrence and hence lack of statistical significance but should be recorded as background information)
- Appropriateness of antibioprophylaxis following C-section (tailored–clinical effectiveness–antibioprophylaxis)
- Length of stay following delivery (stratified for vaginal or C-section birth) (core–efficiency–length of stay)

While C-section rates reflect appropriateness of the procedure (Should it be performed?), antibioprophylaxis reflects on technical quality of treatment (How was it performed?) and indicators supplement each other by giving a more complete picture of delivery management within the hospital.

d. Exogenous variables:

Hospital specific factors:
- Major determinants of overall C-section rates: dystocia, fetal distress, breech, repeat C-section
- Potential factors affecting risk for C-sections: maternal age, weight, height or body mass index, parity and previous C-section, gestation and birth weight
- Selection bias expected for clinical factors, e.g. as complicated pregnancies are transferred to tertiary centers, and for socio-demographic factors on public/private or not-for-profit/for profit status.
  • Clinical factors may not all be identified from administrative data and supplement risk factors based on birth records or patient record may need to be collected.
  • Limited correlation between rankings on unadjusted or adjusted rates and between rankings based on different risk adjustment techniques. Reliable risk-adjustment techniques are available only for primary C-section.
  • Risk adjustment for nulliparity, birth weight, gestational age, (from birth record) and ICD-9 codes (from discharge abstract).
- Physician age, sex, medical school, group practice, recent medico-legal claims
- Level of pediatric services and architecture of maternities.
- Method of financing (e.g. in Italy, public, semi-private with arrangements with the national health service, completely private)
- Availability of resources to monitor vital signs and realize C-section in emergency (may be a concern in very low resources settings and may trigger more C-section)

Area specific factors:
- Selection bias for socio-demographic factors on grounds of geographic localization.
- Socio-demographic factors related to C-section rate: age, insurance status, and, less notably, race and ethnicity. Selection bias due to patient preferences may occur.
- Potential proxy: average income in the area and other census data such as average number of children per women

Country-specific factors:
- Cultural factors: to some degree, patient’s preference and litigation practices may intervene
- Financial incentives (not) to perform C-section, from physicians’ point of view
- Extremely low rates of C-section may represent a lack of access to health care
Clinical effectiveness: Caesarean section

- **Potential proxies**: average C-section rate in the country

e. **Quality improvement strategies**:
   1. How is C-section monitored within hospital? With whom is the information shared?
   2. Is there any written policy or guidelines on C-section?

A patient centered perspective on C-section addresses the role of informed consent, importance of patient choice and patient autonomy, physician responsibility in providing balanced information and honoring patient choice for elective repeat C-section.\(^{19}\)

A safety perspective on C-section addresses complications from C-section (and from vaginal delivery or failed vaginal delivery after C-section) and appropriateness of antibioprophylaxis following C-section.

### 4. Data collection issues

Questions to discuss during 1st workshop on PATH implementation:

- Potential sources of data: birth register, theatre register, delivery suite register, maternity case notes, patient records, administrative database (e.g, invoice data), discharge abstract, national specific register
- For detailed analysis of results, see methodology – and especially data collection tools – used for the National Sentinel Caesarean Section Audit

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3. CRAG
Clinical effectiveness: Caesarean section


18 “In audit of UK maternal request, as reported by the clinician, was the primary indication for performing 7% of C-sections” (p. 17). RCOG Clinical Effectiveness Support Unit. The National Sentinel Caesarean Section Audit Report. Eds: Royal College of Obstetricians and Gynecologists, London, UK, 2001. 118 p. Available on www.rcog.org.uk

**Clinical effectiveness:**
**Admission after day surgery, for selected tracer procedures**

1. **Definition**

   a. **Numerator:** Number of patients undergoing a tracer procedure who have a discharge intention of one day
   
   b. **Denominator:** Total number of patients who have an operation/procedure performed in the day procedure facility
   
   c. **Tracer procedures:** cataract surgery, knee arthroscopy, inguinal hernia, curettage of the uterus, tonsillectomy and/or adenoidectomy, cholecystectomy, tube ligation, varicose veins – stripping and ligation

      Those tracer procedures cover most of the specialties with a high volume and represent different level of innovativeness

      The same tracer procedures are used for the indicator “rate of one-day surgery”
   
   d. **Definitions:**

      Identification of day-surgery patient is left for local determination. In some countries, day-surgery patients are attributed a specific code on admission and hence can easily be identified from database. In other countries, a special register will need to be set up.

      - **Early readmission:** patients not discharged. They are transferred directly from the day procedure facility to an overnight facility or indirectly through an observation facility first. They are not discharged between the end of surgery and admission to hospitalization unit.
      
      - **Late readmission:** Patients who were discharged following surgery and are admitted within 72 hours after discharge.
   
   e. **Exclusion criteria:** Because of data collection issues, and because it is more meaningful from a clinical point of view, only early readmission are included in this indicator. The patient is not discharged home before admission to inpatient acute care facility. Unplanned admission within 72 hours of discharge is proposed as a tailored indicator.

      Only admission to the hospital where the day-surgery took place are included.

2. **Rationale – Justification for use**

   a. **Burden:**

      - Admission following day surgery is distressing for the patient
      
      - Some admissions are caused by major complications such as perforated uterus or bowel or haemorrhage while others are caused by minor complications such as postoperative pain or delayed recovery.
   
   b. **Importance – Prevalence – Potential for improvement:**

      The prevalence rate is relatively low. A meta-analysis of 6 studies from 1990 to 1997 indicates a rate of 2.42%\(^1\). In more recent literature we identified rates ranging from 1.5%\(^2\) to 3.4%\(^3\). Low prevalence rate is balanced by a high potential for improvement. Around 75% of admissions are justified by postoperative pain, nausea or social problems and thought to be preventable\(^4\)\(^5\)

   c. **Hospital impact:**

      In response to indicator monitoring as part of the accreditation process of the ACHS, diverse actions were reported by 64% of organizations as a result of indicator monitoring\(^6\). Those actions include increased patient education, production of information leaflets, establishment of pre-anaesthetics clinics, alteration of surgical techniques, introduction of drug trials and a number of policy changes.
d. **Validity:**

<table>
<thead>
<tr>
<th>Early admission reflects technical quality of surgery (CEᵢ)</th>
<th>e.g., appropriateness of patient selection for one day, clinical team ability, pain management, and adverse events (PSᵢii), etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Late admission (after being discharged) reflects patient education (PCᵢii) and continuity of care (RGᵢv)</td>
<td>Admission following day-surgery negatively impacts on patient experience (PCᵢv)</td>
</tr>
</tbody>
</table>

**Rationale:** Most admissions following one-day surgery could have been avoided by proper patient education and patient selection. Many complications leading to admission are directly related to process of care (e.g., complications during surgery) and professional competencies.

We did not find any evidence of an association between admission following ambulatory surgery and process of care or outcomes of care.

| **Strengths:** | Most admissions are thought to be preventable, good face validity (rationale) |
| **Limits:** | Low prevalence rate, no evidence to support validity, only makes sense when related to rate of ambulatory surgery (as a proxy for patient case-mix) |

3. **To add meaning – Guide for interpretation**

When combined to rate of one day surgery:

```
| Screening tool | X | Conclusive assumption |
```

a. **Direction and targets:** Lower readmission rates are better.

- Targets by the (UK) Royal College of Surgeon for urology: < 3%
- Targets by the (UK) Royal College of Anaesthetists²:
  - < 2% admission for surgical reasons
  - < 1% admission for anaesthetic/medical reasons (ASA 1 & 2)
  - < 5% admission for anesthetic/medical reasons (ASA 3)
  - < 1% re-admission after discharge

b. **Stratification – alternative measures:**

- Also report rate of readmission (patients re-admitted within 72 hours after discharge)
- Stratify by main causes for readmission⁸ (surgical, anaesthetist, social) or more specifically for most common causes of readmission such as pain, nausea and vomiting, no carer at home, minor complication, major complication during surgery, etc.

c. **Related performance indicators:**

- Rate of one day surgery (Core – efficiency)
  - **Expected relationship:** both indicators provide indirect measures of patient selection for day surgery. Day surgery rate provides information on the quantitiy of patients selected for day case procedure and admission following day surgery following provides information on quality of patient selection. If rate of one day surgery is higher, we expect more complex interventions or interventions on more frail patients to be realized it may explain why admission rate are higher. The objective is to achieve an optimal balance between high day surgery rate and low rate of admission after day surgery.

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¹ Dimension: Clinical effectiveness
² Dimension: Patient safety
iii Dimension: Patient centeredness
⁴ Dimension: Responsive governance
⁵ Dimension: Patient centeredness
Clinical effectiveness: Admission after day surgery

- Cancelled one-day surgery on day of operation for clinical reasons (Core – patient centeredness)
  - Expected relationship: Quality of pre-assessment impacts on both indicators. Timely identification of potential –clinical or social– problems should positively impact both indicators. Hence, we expect them to be positively related.

Rate of one-day surgery, cancelled one-day surgeries and admission following day surgery compose a cluster on quality of care in ambulatory surgery.

If specific surveys are organized for one-day surgery patients, scores on information and education, continuity of care, and pain management and global satisfaction should also be related to. Those surveys were not included in the set of indicators because of the burden of tool development of data collection but nevertheless they are extremely useful and their results should be incorporated into the general framework of performance measurement.

d. Exogenous variables:
- Patient factors may be decomposed into three categories: pre-surgery (e.g. age), during surgery (e.g. duration of surgery) and post-surgery (e.g. nausea). Patient factors are not properly understood nor do studies provide consistent results. Patient factors should not entirely be considered as exogenous variables. Adjustment for those patient factors would not only mask variations in case-mix. They would also mask variations in quality. Indeed, pre-surgery factors reflect appropriateness of patient selection for ambulatory care and during- and post- surgery factors are strongly affected by process of care.
- Hospital factors\(^{vi}\):
  - Equipment available, availability of drugs (for pain management and anaesthesia)
  - Freestanding vs. attached facilities\(^9\)
- Contextual factors
  - Social support: carer at home
  - Proportion of interventions in hospital-affiliated, freestanding ambulatory centers and physician office in the area, serves as a proxy for patient case-mix
    - Expected relationship: with more office-based interventions supposed to drive more minor interventions out of the hospital and increase complexity of intervention within hospital or in hospital affiliated ambulatory centers). Hence, selection of tracer procedures need to take into account this factor and try to minimize the possibility of “concurrent” facilities and to focus on those interventions that require the use of fully equipped operating theatre.

e. Quality improvement strategies:
Open question: List strategies oriented towards:
- Patient selection and pre-operative assessment
- Patient waiting time
- Patient education
- Pre-operative anaesthesia
- Discharge criteria
- Implementation of clinical pathways to deal aggressively with problems such as pain, nausea, and vomiting
- Follow-up with nursing care
- Postoperative analgesia
- Earlier operating time for certain procedures

Those area of care evaluated using audit questions on structure and process such as developed by the [UK] Audit Commission\(^{10}\) (appendix 2)


\(^{vi}\) Partly under hospital control depending on hospitals’ degree of autonomy in the country
Clinical effectiveness: Admission after day surgery


1. Definition

**Core indicator:** Antibiotics prophylaxis administration in accordance with guidelines (timing, dosage, choice of agent) for selected tracer operative procedures

An ideal “global” rate of (prophylactic) antibiotic consumption cannot be established. So the adequateness of prescribing and timing of administration need to be examined on a case-by-case basis, relying on widely accepted guidelines. A random sample of cases is selected to lower the burden of data collection.

**Numerator:**
- Version 1: Total number of audited medical records with evidence of over-use of antibiotics (too early and/or too long, too high dose, too broad spectrum)
- Version 2: Total number of audited records with evidence of under-use of antibiotics (too late, too early termination, too low doses, narrow spectrum where broad spectrum would have been required)

**Denominator:**
- Total number of medical record audited for a specific tracer operative procedure

**Exclusion/inclusion criteria:** 1) excluded if evidence of pre-operative infection; 2) more criteria to be determined

**Tracer procedures:** knee arthroplasty, cesarean section

Other potential tracer procedures: appendectomy, hysterectomy, total hip replacement, coronary artery bypass graft

For content validity of the set, both clean and contaminated procedures should be included in the core list of tracers. Preference is given to procedure with high prevalence rate.

This indicator is limited to a number of operative tracer procedures for which international guidelines on antibiotic prophylaxis are available. The tracer procedures will be defined in a further step of the project.

For each selected procedure, medical records are sampled and audited by trained professional.

Ideally, for the core set, participants to pilot implementation of PATH should agree on international guidelines. In the tailored set, assessment against international guidelines can be completed by assessment against national or local guidelines.

Hospitals are advised to add some more tracer conditions (e.g. community-acquired pneumonia) in the tailored set. In the core set is limited to antibiotic prophylaxis before surgery. But a recent study revealed over-consumption of antibiotics prophylaxis before surgery and under-treatment with antibiotics in internal medicine department. So that conclusion of the core indicators cannot be generalized to the whole sphere of antibiotics. Moreover, one study suggests that the impact of active antimicrobial drug use programs is limited to the specific departments where they are implemented (no “halo effect”). Hence results could vary depending on tracer procedures and condition selected.

2. Rationale – Justification for use

**a. Burden:**

When administered in compliance with guidelines, antibiotic prophylaxis significantly reduces risk for postoperative infections. Postoperative infections are associated with a high morbidity and mortality and are often very costly.

Antimicrobial use is the major determinant in the development of resistance. There is little doubt that careful antibiotics prescribing can curtail the emergence and reduce the prevalence of resistance.

The increasing use of antibiotics is resulting in huge hospital expenditures. Antibiotics consumption is a major cost driver. Average cost per patient day for antimicrobial agents is estimated to 10 USD-40 USD in tertiary care medical school affiliated hospitals.
Antibiotic prophylaxis use, for selected tracer procedures

b. Importance – Prevalence – Potential for improvement:
- High variations in antibiotic use suggest potential for improvement. Inappropriate usage of antibiotics has been observed in a substantial proportion of inpatients. For instance, recent studies in Turkey and Germany indicated that only respectively only 26% and 28 percent of surgeons were using appropriate prophylaxis in all ways (timing, dosage). Timing seems to be the major challenge.
- In hospitals, antibiotics are prescribed by almost all physicians so that programs to improve quality of prescribing need to be agreed on throughout the hospital

c. Hospital impact:
- Antibiotics use programs have proved useful in different settings

d. Validity:
Reflects Antibiotics utilization may represent quality of care, risk avoidance, access to services and equity. It is also a determinant of cost efficiency.

| Reflects technical quality, organization of care (especially for timing), safety procedures (CE– PS) |
| Strongly impacts on complications (PS) and costs (Eff) |

Strong face validity: Monitoring antibiotics administration is a widely accepted practice to control antimicrobial resistance. It is used in a large number of settings and included in accreditation standards.

Previous use: JCAHO(planned implementation) and CMS: prophylactic antibiotic received within 1 hour prior to surgical incision, prophylactic antibiotic selection for surgical patients, prophylactic antibiotics discontinued within 24 hours after surgery end time

Construct validity: We did not find any study relating an indicator of appropriateness of antibiotic administration with indicators of process or outcomes of care. However, at the patient level, perioperative antibiotic prophylaxis has been demonstrated to significantly decrease the risk of wound infection.

Conclusion:
- Strengths: appropriate antibiotics prescription is a crucial public health issue and should be covered by at least one indicator for content validity of the set of indicators as a whole, strong face validity
- Limits: burden of tool development and data collection, covers only a limited area of antibiotic use

3. To add meaning – Guide for interpretation

| Screening tool | X | Conclusive assmt |

a. Direction and targets: Higher rate of appropriateness is preferred.
b. Stratification – alternative measures:

Complementary indicators,
by patient type and specialty (intensive care unit / surgical / obstetrics / medical)
- Number of guidelines on antibiotics updated during the previous year (or 5 years)
& Number of procedures for which antibiotics guidelines disseminated within the hospital

i Dimension: clinical effectiveness and patient safety
ii Dimension: Patient safety
iii Dimension: Efficiency
iv Joint Commission on Accreditation of Healthcare Organizations
v Centers for Medicare and Medicaid Services
Antibiotic prophylaxis use, for selected tracer procedures

**Rationale:** Diffusion of updated guidelines is a crucial strategy to control antibiotics consumption and resistance.

- **Antibiotics use** density (penetration index\(^\text{12}\)):
  - Defined Daily Doses / 1000 patient days
  - Cost / 1000 patient days
  **Rationale:** This measure provides an overall picture of antibiotics consumption in the hospital. However, it is very difficult to interpret because of variations in case-mix.

- **Antibiotics use** evolution: % variation in use density compared to year before and 2 years before
  **Rationale:** Measures on antibiotics use density are difficult to interpret in absence of adjustment for case-mix. By restricting comparisons to hospital’s past performance, patient factors are limited. Increased use of antibiotics may be explained by variations in case-mix, increased resistance incidence or change in practice.

- **Antibiotics specificity**:
  Defined daily dose of vancomycin and/or third generation cephalosporins divided by total defined daily dose of antimicrobials
  **Rationale:** Evidence suggests that control of broad-spectrum antibiotics decreases incidence of antibiotic-resistant bacteria\(^\text{13}\). Intensive vancomycin use may flag high incidence of resistance.

c. **Related performance indicators:**

- **Nosocomial infections** by type (Tailored – Safety)
  - Nosocomial pneumonia
  - Urinary tract infection
  - Primary bloodstream infection

- **Percentage patient with length of stay above a predefined** (for identical tracer procedures)
  (Alternative definition for length of stay – Core – Efficiency)
  **Expected relationship:** If antibiotics prophylaxis prevents complications, it will ultimately average reduce length of stay.

d. **Exogenous variables:**

- **Patient-specific factors**
  - Because we rely on audit of medical record, patient specific factors are explicitly taken into account when computing appropriateness indicators.
  - Case-mix strongly influences alternative indicators – such as Defined Daily Doses per 1000 patient days– and strongly challenges interpretation. For this reason, we suggest to stratify alternative indicators by specialty / department and to focus on time trends (relative increase or decrease in consumption).

- **Hospital specific factors**:
  - Local bacterial ecology – resistance
  - Degree of Hospital autonomy to order drugs

- **Country-specific factors**:
  - Financial incentives associated with drug administration in hospitals (retrospective or prospective reimbursement of drugs)

e. **Quality improvement strategies:**

Open question: List strategies to improve antibiotics administration such as:

- Diffusion of updated guidelines, local prescribing consensus with all prescribers, pocket size prescribing guide regularly updated
- Restricted prescription policies for most expensive antibiotics (with or without control; e.g. oral validation by an expert or the institution’s infectious diseases specialist)
Antibiotic prophylaxis use, for selected tracer procedures

- Limited susceptibility testing
- Physician profiling and feedback, assessment of prescribing by regular audits
- Antimicrobial agents team, infectious disease consultation service

List also all strategies oriented towards
- Improve awareness on cost of antibiotics
- Physician training
- Pharmacist involvement

4. Data collection issue

Steps for data collection:
1. Selection of guidelines
2. Training of data abstracters (to increase knowledge of guidelines)
3. Random sampling of medical records (e.g. for each tracer procedure)
4. Data abstraction from medical records and judgment on appropriateness of antibiotics use

Operationalization of definition:
- Select operative procedures for which guidelines are widely accepted
- Define population: inclusion / exclusion criteria
- Specify sampling procedure and number of medical record audited
- Assess cost (burden of data collection)

To compute indicators:
- How to aggregate indicators for different tracers
- How to aggregate different level of appropriateness (under-use / over-use / inappropriate molecule)?

Other questions:
- Which complementary indicators are currently measured / could be measured / should be measured?

1 Gyssens IC, Kullberg BJ, van der Meer JW. Clinical results and costs due to improved antibiotics policies (article in Dutch). Ned Tijdschrift Geneeskunde 1999;143(47):2361-2364.
5 Kern WV, Rose AD, Muche HR, Frank U. Antimicrobial expenditures and usage at four university hospitals.
6 Kern WV, Rose AD, Muche HR, Frank U. Antimicrobial expenditures and usage at four university hospitals.
11 Hospital antibiotic control measures in the UK. Working party of the British Society for Antimicrobial Chemotherapy
13 Murty R. Implementation of strategies to control antimicrobial resistance. Chest 2001;119(2 suppl.):405S-411S.
Sheet 7: Sentinel events

Definition by the JCAHO (www.jcaho.org):

- "A sentinel event is an unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof. Serious injury specifically includes loss of limb or function. The phrase, "or the risk thereof" includes any process variation for which a recurrence would carry a significant chance of a serious adverse outcome.

- Such events are called "sentinel" because they signal the need for immediate investigation and response."

Categories identified by the JCAHO:

- Patient suicide
- Op/post-op complication
- Wrong-site surgery
- Medication error
- Delay in treatment
- Patient death/injury in restraints
- Patient fall
- Assault/rape/homicide
- Transfusion error
- Perinatal death/loss of function
- Patient elopement
- Fire
- Ventilator death/injury
- Infection-related event
- Anesthesia-related event
- Medical equipment-related
- Maternal death
- Infant abduction
- Utility systems-related event
- ...

Very high importance: Sentinel events are very important because they have extremely strong negative impact on patients even though prevalence is very low.

Extremely low reliability and hence validity: The main concern with this indicator is the extremely low reliability. Because of this issue, directionality of the indicator is unclear. Less sentinel events are, of course preferred. The target should be that no sentinel events occur. However, practically, it is unclear how to interpret no or extremely few sentinel events reported. It may mean either that no sentinel events occurred either that the sentinel events that occurred were simply not reported, because there is no formal procedure to report sentinel or that workers are not educated/motivated/confident to report them or that they are simply not identified. This issue is also addressed for the indicator on staff percutaneous injuries.

Clearly, this indicator must only be used as a screening. It is not conclusive at all. This means that

1. Number of adverse events should not be used for comparisons between hospitals. The only “norm” it can be compared to is a target of zero occurrence. It only makes sense if reporting procedures are clearly indicated.

2. It could be completed with an indicator on the proportion of sentinel events for which there is written evidence that measures were taken in order to understand the causes of the sentinel event and to corrective measure or an action plan implemented to avoid further occurrence of such event.

This indicator was included in the core list, regardless of low reliability because it sends a strong signal that such events need to be closely monitored and trigger corrective preventive measures.
Descriptive sheets for PATH core set Efficiency indicators

A descriptive sheet was designed for most indicators proposed in the core set. It contains operational definition, rationale and justification for use, and a guide for interpretation. The descriptive sheets aims at supporting a final selection of evidence-based indicators and at supporting hospitals in building indicators and using their data to identify potential quality improvement initiatives.

Sheet 1: Day surgery rate, for selected tracer procedures
Sheet 2: Length of stay, for selected tracer conditions or procedures
Sheet 3: Inventory in stock
Sheet 4: Intensity of use of surgical theatre
**Efficiency: Day surgery rate, for selected tracer procedures**

1. **Definition**

   a. **Numerator**: Number of patients undergoing a tracer procedure who have a discharge intention of one day
   
   b. **Denominator**: Total number of patients undergoing a tracer procedure
   
   c. **Tracer procedures**: cataract surgery, knee arthoscopy, inguinal hernia, uterine artery embolization, tonsillectomy and/or adenoidectomy, cholecystectomy, tube ligation, varicose veins – stripping and ligation

   Those tracer procedures cover most of the specialties with a high volume and represent different levels of innovativeness.

   The same tracer procedures are used for the indicator “admission after one-day surgery.”

   d. **Definitions**: There is a clear need for defining “day surgery” to increase comparability of day surgery statistics.

      - **Alternative definition**: “Day surgery is the admission of selected patients to a hospital for a planned surgical procedure, returning home on the same day. True day surgery patients are day cases who require full operating theatre facilities and/or general anaesthetic, and any day cases not included as outpatient or endoscopy (…) Minor day cases are day case patients who generally do not require full operating theatre facilities or general anaesthetic for example, patients having endoscopies or coloscopies and many, but not all, pain relief procedures and minor surgery.”

      - **Alternative definition**: “Day surgery is defined as planned surgical procedures carried out in a hospital, where the patient does not stay for more than twelve hours.” Cut-off may be extended to 24 hours in special extended care facilities.

   Difficulties regarding uniform definitions are partly overcome by proper selection of tracer procedures: focusing on “true day surgery” and avoiding too broad surgical categories. Moreover, a glossary of terms should be developed to define outpatient – ambulatory – one-day surgery. All indicators based on one-day surgery (admission following day surgery, rate of day surgery and cancellation of day surgery) must rely on the same definitions, tracer procedures and inclusion/exclusion criteria.

   It was decided that determination of day-surgery patient is left for local determination. In some countries, day-surgery patients are attributed a specific code on admission and hence can easily be identified from database. In other countries, a special register will need to be set up.

   e. **Inclusion/exclusion criteria**: Limit to elective procedures, exclude emergency procedures and patients who died.

2. **Rationale – Justification for use**

   a. **Burden**: The main justification for day surgery is to save health care resources but also to reduce the time that patients are sick, and to facilitate their recovery.

   b. **Importance – Prevalence – Potential for improvement**: Day surgery has been a priority area for hospital reforms in the recent years.

   - **Rate of one-day surgery for Western European and North American countries are described in appendix.**

   - In the countries studied, some procedures have little potential for improvement because of the already very high rate of one-day surgery. However, this observation cannot be generalized to Eastern European countries in the absence of statistics and could be relevant.

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Efficiency: Day surgery rate, for selected tracer procedures

- In other cases (e.g. dilatation and curettage of the uterus or knee arthroscopy), the variation between countries is remarkably high and indicates large potentials and/or differences in reporting.
- In our survey in participating countries on importance and relevance of indicators and data availability, Slovakia noted that most hospitals are just starting with one day surgery, because previously hospitals were reimbursed according to occupied beds and days. Lithuania noted that day surgeries are currently under development and in introduction process. Few surgical cases (ophthalmology) are treated as day surgery; others will be in use in a few years.

c. Hospital impact:
- Poor day surgery rates may be explained by (1) insufficient day surgery capacity, (2) physician’s practices, (3) poor use of management of its day surgery unit.

d. Validity:

| (1) Reflects cost-efficiency and appropriateness (Dim: Eff\(^{ii}\)) |
| (2) Reflects innovativeness and diffusion of technologies (Dim: CE\(^{iii}\)) |
| (3) Impacts on outcomes (Dim: CE) and patient satisfaction (Dim: PC\(^{iv}\)) |
| (4) Requires smooth organization of care around patient and impacts on patient flow (Dim: PC) |

Strong rationale:
(1) Dimension efficiency – Cost-efficiency and optimal use of capacity:
- In a context of limited bed availability, increased one-day surgery will release inpatient beds for major cases and hence improve access and reduce waiting times
- Inpatient days are highly resource intensive.
- Cost-effectiveness of one-day surgery was demonstrated for a number of surgical procedures and different context

(2) Dimension clinical effectiveness – Innovativeness and diffusion of technologies:
- It has been the recent improvement in anaesthetic drugs and procedures and in surgical techniques that allowed more operations to be completed as day surgery cases. A prerequisite for increased use of day surgery is the development of less invasive surgery, such as laparoscopy and endoscopy. Pain management and anesthesia techniques are pivotal to successful day surgery.
- The degree to which this indicator reflects innovativeness depends on choice of tracer procedure. For instance, “physicians that provide laparoscopic cholecystectomy in a day surgery setting can be classified as innovators. The executers of cataract surgery in day surgery can be classified as early adopters. The surgeons who did not execute curettage and dilatations of the uterus in 1999 may be characterized as laggards”.

(3) Patient centeredness perspective on clinical effectiveness – Outcomes and patient satisfaction: (faster recovery, focus on pain management)
- Risk of hospital acquired infection is reduced
- Patient surveys indicate that the great majority of patients prefer to recover home rather than staying overnight in hospital: less impact on daily life, less
- Day surgery is indicated for children as overnight admission is often the most distressful part of visiting hospital for them\(^{2}\).

(4) Patient centeredness – Organization of care:
- The necessity to adapt and to transform the traditional hospital is a major challenge for the development of ambulatory surgery\(^{3}\). In ambulatory surgery the priorities are reversed as the organisational priorities are reversed and the patient is truly the focus of the organisation. In a traditional hospital, the patient is certainly central to diagnostic and therapeutic preoccupations but not the organisation. Organisation is centred on resources: physicians, nurses and equipment.
- Cancellation of surgery due to emergency pressures in a dedicated day surgery unit is unlikely.

\(^{ii}\) Dimension: Efficiency
\(^{iii}\) Dimension: Clinical effectiveness
\(^{iv}\) Dimension: Patient centeredness
**Efficiency: Day surgery rate, for selected tracer procedures**

**Great consensus on use:** In our survey of 11 countries on indicators perceived importance and relevance and data availability, it is used in all 11 respondents’ hospitals and by central authorities in 7 out of 10 countries. Not used in Slovakia, Denmark and Albania.

**Strengths:** very strong rationale

**Limits:** no standard definition or measurement of day surgery across countries, difficult to interpret because it is multi-faceted and reflects and impacts on several dimension of performance, hospital influence is limited by availability of technology

### 3. To add meaning – Guide for interpretation

When combined to rate of admission after day surgery:

- **Screening tool**
  - Occupation rate of the day case unit operating theatres
  - **Bed occupancy rate:** (weighted) throughput per beds per month (bed means patient recovery space and includes trolley and reclining chairs). In the UK, cases are weighted so as to reflect different workload: true day case and patients: 1.0; minor day cases: 0.5; pre-operative assessments: 0.1.
  - **Staffing ratio:** (weighted) throughput per full-time equivalent member of staff per month
  - True day surgery patients treated in day surgery units as a percentage of all day-case patients (including both true day cases and minor cases)

- **Conclusive assessment**
  - Expectation: both indicators question and reflect on the optimal use of (bed) capacity. They are both influenced by similar factors (financing of hospital days, bed occupancy rate, availability of alternative resources).
  - Admission following day surgery
  - **Expected relationship:** both indicators provide indirect measures of patient selection for day surgery. If rate of one day surgery is higher, we expect more complex interventions or interventions on more frail patients to be realized and may explain higher why admission. The objective is to achieve an optimal balance between high day surgery rate and low rate of admission after day surgery. Day surgery rate provides information on the **quantity** of patients selected for day case procedure and admission following day surgery following provides information on **quality** of patient selection.

If hospital is performing patient surveys for this specific patient category, results on patient satisfaction or patient experience could be included in the framework.
d. Exogenous variables:
   - **Patient factors**
     - Anaesthetic risk (can be measured with ASA risk index)
     - Most common risk factors: elderly, comorbid chronic conditions such as insulin-dependent diabetic patients, patients on treatment with oral anticoagulants
     - Patient preferences and financial incentives (mainly for international comparisons)
     - Distance from hospital
     - Support at home: family and/or social support, availability of home care
   - **Hospital factors** (degree of hospital influence depends on the context):
     - Availability of inpatient beds
       - Measure: Bed occupancy rate
     - Availability of technology
     - Accommodation and facilities dedicated to (extended-) day surgery
       - Measure: binary variable (Yes/No)
     - Operating theatres dedicated to day surgery (alternative: operating list made up entirely of day cases)
       - Measure: binary variable (Yes/dedicated lists/No)
   - **Country or regional factors**
     - Financial support available to develop day surgery
     - Financial incentives from the point of view of hospital, physicians and patients

e. Quality improvement strategies:
   - Investments in equipment and dedicated facility and operating theatre –or operating list– for day surgery
   - Guidelines on patient selection for day surgery
   - Patient education leaflet to increase acceptance of day surgery
   - Training of physician and nurses
   - Increased coordination with home care agencies
   - Hospital – hotel facility for patients living far away from hospital or patients with no social backup
Appendix: prevalence and evolution of day surgery in European countries

Table 1: Ratios of ambulatory surgery for selected procedures (in Lathouwer and Poulion 1998)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Knee arthroscopy</td>
<td>30.6</td>
<td>44.9</td>
<td>6.1</td>
<td>45.5</td>
<td>50.7</td>
<td>77.6</td>
<td>2.5</td>
<td>59.8</td>
<td>93.5</td>
<td>91.3</td>
</tr>
<tr>
<td>Extraction of teeth</td>
<td>60.5</td>
<td>78.3</td>
<td>45.5</td>
<td>65.1</td>
<td>61.8</td>
<td>78.3</td>
<td>42.5</td>
<td>67.4</td>
<td>41.4</td>
<td></td>
</tr>
<tr>
<td>Cataract surgery</td>
<td>28.3</td>
<td>72.7</td>
<td>6.1</td>
<td>11.1</td>
<td>29.3</td>
<td>3.0</td>
<td>37.1</td>
<td>96.9</td>
<td>94.5</td>
<td></td>
</tr>
<tr>
<td>Inguinal and femoral hernia</td>
<td>7.1</td>
<td>20.3</td>
<td>16.5</td>
<td>5.2</td>
<td>2.6</td>
<td>5.9</td>
<td>23.4</td>
<td>84.4</td>
<td>44.3</td>
<td></td>
</tr>
<tr>
<td>Dilatation and curettage of uterus</td>
<td>42.7</td>
<td>45.3</td>
<td>16.5</td>
<td>39.9</td>
<td>45.8</td>
<td>33.7</td>
<td>57.6</td>
<td>92.5</td>
<td>90.3</td>
<td></td>
</tr>
<tr>
<td>Tonsillectomy</td>
<td>32.4</td>
<td>2.3</td>
<td>3.0</td>
<td>N/A</td>
<td>0.4</td>
<td>85.0</td>
<td>2.0</td>
<td>2.4</td>
<td>89.3</td>
<td>50.4</td>
</tr>
<tr>
<td>Excision of breast lump</td>
<td>15.3</td>
<td>37.7</td>
<td>12.6</td>
<td>60.9</td>
<td>42.2</td>
<td>14.4</td>
<td>47.6</td>
<td>93.9</td>
<td>88.2</td>
<td></td>
</tr>
<tr>
<td>Total for 18 most common procedures</td>
<td>39.2</td>
<td>41.3</td>
<td>32.2</td>
<td>N/A</td>
<td>37.6</td>
<td>57.8</td>
<td>10.4</td>
<td>46.3</td>
<td>93.2</td>
<td>79.2</td>
</tr>
</tbody>
</table>

Table 2: Reported statistics on twelve day surgery procedures in the Nordic countries in 2001 (in NOMESCO)

<table>
<thead>
<tr>
<th>Procedure group</th>
<th>Denmark</th>
<th>Finland</th>
<th>Iceland</th>
<th>Norway</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decompression of median nerve</td>
<td>76</td>
<td>83</td>
<td>67</td>
<td>90</td>
<td>95</td>
</tr>
<tr>
<td>Cataract surgery</td>
<td>91</td>
<td>85</td>
<td>81</td>
<td>87</td>
<td>95</td>
</tr>
<tr>
<td>Tonsillectomy and/or adentoidectomy</td>
<td>18</td>
<td>55</td>
<td>36</td>
<td>41</td>
<td>48</td>
</tr>
<tr>
<td>Repair of hernia</td>
<td>48</td>
<td>38</td>
<td>26</td>
<td>55</td>
<td>67</td>
</tr>
<tr>
<td>Laparoscopic cholecystectomy</td>
<td>9</td>
<td>3</td>
<td>6</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>Curretage and excision of endometrium</td>
<td>66</td>
<td>62</td>
<td>82</td>
<td>62</td>
<td>76</td>
</tr>
<tr>
<td>Termination of pregnancy</td>
<td>75</td>
<td>84</td>
<td>98</td>
<td>96</td>
<td>87</td>
</tr>
<tr>
<td>Female sterilization</td>
<td>69</td>
<td>73</td>
<td>86</td>
<td>82</td>
<td>83</td>
</tr>
<tr>
<td>Removal of implanted devices from bone</td>
<td>47</td>
<td>50</td>
<td>46</td>
<td>34</td>
<td>61</td>
</tr>
<tr>
<td>Knee arthroscopy</td>
<td>70</td>
<td>63</td>
<td>37</td>
<td>73</td>
<td>91</td>
</tr>
<tr>
<td>Arthroscopy on the knee meniscus</td>
<td>68</td>
<td>71</td>
<td>82</td>
<td>83</td>
<td>93</td>
</tr>
<tr>
<td>Ligature and resection of veins of leg</td>
<td>44</td>
<td>48</td>
<td>27</td>
<td>75</td>
<td>90</td>
</tr>
</tbody>
</table>

Table 3: Day surgery growth in the UK: Day case surgeries as a percentage of all elective surgical admissions in the UK (Jarrett PEM 1997 in Mitchell 1999)

<table>
<thead>
<tr>
<th>Date</th>
<th>Day cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989/90</td>
<td>34</td>
</tr>
<tr>
<td>1990/91</td>
<td>37</td>
</tr>
<tr>
<td>1991/92</td>
<td>41</td>
</tr>
<tr>
<td>1992/93</td>
<td>45.5</td>
</tr>
<tr>
<td>1993/94</td>
<td>48</td>
</tr>
<tr>
<td>1994/95</td>
<td>52</td>
</tr>
</tbody>
</table>

1. Definition

a. **Definition**: Median number of days of hospitalization (admission and discharge date count for one day) for selected tracer conditions and procedures

b. **Tracer conditions**: This indicator is limited to a number of tracer procedures. A specific indicator is computed for each tracer procedure. All indicators are then aggregated in a global indicator. Preference is given to elective, scheduled procedures

   - **Core tracers**: uncomplicated delivery, hysterectomy
   - **Tailored tracers**: stroke (limited to one specific code to limit to a more homogenous group of patients), acute myocardial infarction, hip fracture

   In the tailored, a global indicator on elective surgery may be incorporated as a tailored indicator.

Tracer condition is identified using only the principal or primary diagnosis code

c. **Exclusion criteria**: patients transferred to / from other hospitals

   Transfer rates and – ideally – destination should be reported simultaneously as a proxy for case-mix.

d. **Comments**: In hospitals with long-term care units such as geriatric care, only days in high level of care (intensive, intermediarly or acute care) should be included in the calculation of the indicator.

e. **Complementary measure**: Length of stay before the first procedure, for elective surgery

2. Rationale – Justification for use

a. **Burden**: Negative impact of **long stays**:

   - **For the society**: financial burden (hospital settings are resource-intensive settings), if limited availability, hinder access to hospital care (beds occupied by patients who could be taken care of in other context while patients who would require hospital care have no access)
   - **For the hospital**: financial burden (if global budget or fee per admission)
   - **For patients**: financial burden (if significant patient intervention in hospitalisation cost), increased exposure to hazards (risk of nosocomial infections)
   - **More specifically, for diabetes patients**. The National Service Framework for Diabetes (UK)\(^1\) established a standard for “care of people with diabetes during admission to hospital”. It is motivated by the fact that people with diabetes “frequently describe poor experience of inpatient care, particularly in relation to (...) delays in discharge resulting from their diabetes, especially when diabetes was not the original reason for their admission”.\(^1\)

   Negative impact of **short stays**:

   - **For the society**: transfer of cost to the community
   - **For the hospital**: financial burden (decreased income in a fee per day system), increased case-load (only more severe patients in acute phase remain in hospital)
   - **For patients and relatives**: less time for discharge preparation (fee has to “hurry up”), burden on relatives when back home (e.g. time off required for carer), in some systems transfer of costs to patients (“insurance” does not cover ambulatory care as well as hospital care)
   - Premature discharge could be prejudicial to patient (and eventually induce readmissions)

b. **Importance – Prevalence – Potential for improvement**:

   In many countries, policy makers are debating surrounding the over- or under-bedding. In EU countries, we observe a definite trend towards shorter stays but have not attained US levels. Numerous studies on appropriateness of hospital days indicate a great frequency of inappropriate days (see here-under).

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\(^1\) [http://www.doh.gov.uk/nsf/diabetes/](http://www.doh.gov.uk/nsf/diabetes/)
Efficiency: Length of stay

A special focus on diabetes patients is proposed in the Tailored set because diabetes is a growing public health concern, diabetes patients are likely to stay twice as long in hospital as patients without diabetes, and increased length of stay can be curbed by proper glucose control during hospitalization.2

c. Hospital influence:

The literature reports several successful experiences for reducing length of stay, such as diffusion of length of stay guidelines3 or development of clinical pathways4 and re-engineering of the organization of care, without any negative impact on patient outcomes. Hospitals participating to the Australian National Demonstration Program on best practice in elective surgery reduced length of stay on the average by 6% overall.5 More specifically, for diabetes patients, strategies to reduce length of stay include diabetes specialist nursing services6, diabetes nurse advisor7, and consultation by diabetes team8.

Hospital influence is limited by availability of alternative resources in the community.

d. Validity:

| (1) Direct measure of efficiency and reflects appropriateness (Dim: Eff) |
| (2) Reflects integration and coordination of care with the community, discharge preparation (Dim: RG) |
| (3) Reflects smooth internal process (coordination of care within organization) (Dim: PC) |
| (4) To a lesser extent, reflects complications, pace of recovery (Dim: CE) |
| (5) In a context of under-supply of inpatient beds, reflects access (Dim: RG) |
| (6) Impacts on patient experience |

Very strong rationale:

(1) Efficiency: to maximize use of limited resources, adequate level of care and resources use to patient needs (same rationale as for indicator on day surgery rate). Effect of prospective payment on decline in length of stay is a good illustration of the rationale behind attention to length of stay and the high cost associated with each inpatient days.

(2) Integration and coordination of care: patients requiring alternative services should have access to them (e.g. nursing home, home care, etc.) otherwise hospitals will have to compensate.

(3) Smooth internal process:

(4) Clinical effectiveness:
  o Patient are less exposed to hospital hazards (nosocomial infection): compare benefits and risks of hospitalisation
  o Shorter stay could indicate more effectiveness in treating patients.
  o Longer stays could indicate complications
  o Premature stay could be prejudicial to patient (and induce readmission)
  o More specifically, for diabetes patients: They are at increased risk of complications. A growing body of the literature strongly recommends the concept that optimising glycemic control in the hospital setting would result in improved outcomes, particularly among patients hospitalised for cardiac disease, stroke, infections and surgical procedures9 and glycemic control translates into shorter lengths of stay.

(5) Access: In context of under-supply of beds, the less time patients spend in hospital, the more patient can have access to in-hospital care

(6) Patient satisfaction:
  o Most patients prefer to recover home.

Extremely high consensus on use (result of the survey in participating countries):
- Used in all hospitals and by most central authorities and by central authorities in 7 out of 10 countries. Not used in Slovakia, Denmark and Albania
- Case-mix adjustment for age and sex in the Albanian hospital and with APR-DRGs in Belgium
- It is considered appropriate for longitudinal in hospital comparisons, national comparisons and international comparisons by all respondents.
Efficiency: Length of stay

Mixed evidence of construct validity – demonstrated relationship with other performance indicators:

- Clinical outcomes
  - Readmission: mixed evidence, slightly in favour of greater risk for readmission with lower length of stay. It probably depends on how short are short stays – see illustration for newborns – and discharge preparation. Length of stay can be shortened with no higher risk for readmission if patients are discharged safely with good education, follow-up care, and in a stable condition. But several studies still indicate a higher readmission rate for patients with longer length of stay. This contra-intuitive finding may be due to the fact that patient factors are not properly accounted for and longer length of stay can be perceived as a proxy for severity during the index hospitalisation.

- Process of care
  - Hospital pathways and guidelines appear successful in decreasing length of stay with comparable clinical outcomes. However, in some instances, lower lengths of stay resulted in increased readmissions.
  - More specific elements of process of care have also been linked with length of stay. For instance, rapid antibiotic delivery and appropriate antibiotic selection reduce length of hospital stay of patients with community-acquired pneumonia.
  - In an analysis of 11 operations, the factors generating the highest risks for a prolonged length of stay were the intra-operative process of care (intra-operative blood transfusion, operative time, return to the operating room) and adverse events.

- Patient satisfaction
  - We found one study linking length of stay following delivery with patient satisfaction. Patients with shorter stays were more likely to perceive their stay as “too short”. Moreover, the six measures of satisfaction were lower in the patients who perceived their stay as too short. However, difference in satisfaction according to the length of stay was very small. The authors interpret this result as suggesting that patient’s satisfaction with care may depend more on whether patients perceived length of stay as adequate than on the absolute length of stay.

Conclusion:

Strengths: very strong rationale, low burden of data collection
Limits: difficult to interpret because it may reflect and impact on many different sub-dimensions of performance, difficulties to adjust for differences in case-mix

3. To add meaning – Guide for interpretation

When combined with transfer rates and readmission rates and for specific tracer conditions and procedures only

| Screening tool | X | | | | Conclusive assessment |

a. Direction and targets
- From a point of view of indicator of efficiency, shorter is better.
- From a point of view of clinical effectiveness, shorter is better if it indicates rapid recovery but no premature discharge or in unstable condition. Shorter length of stay should not jeopardize safety.
- Both low and high length of stay should be scrutinized
b. **Stratification – alternative & complementary measures:**

**Stratification**
- **BY Destination:** home, nursing home or rehabilitation care
  - **Rationale:** delayed discharge may occur because of lack of available beds in nursing homes or rehabilitation facility.

**Alternative indicators:**
- **Outliers:** percent patients with length of stay higher than a predetermined threshold (e.g. national average + variance)
  - **Rationale:** outliers are more specific indicators for clinical indicators than median length of stay as they indicate complications or sentinel events
  - **Other potential causative factors are patient severity and lack of long-term beds in the area**
- **Percent of elective surgery on day of admission**
  - **Rationale:** Day of surgery admission is a critical performance indicator in measuring the efficiency and effectiveness of a pre-admission service\(^\text{17}\). Hospitals have definite impact on this indicator. In the Australian National Demonstration Hospital Program on best practice in managing elective surgery participating hospitals significantly increased rate of admission on day of surgery. Quality pre-admission services positively impact on both rate of day surgery and rate of admission on day of surgery. Both strategies have proved cost-effective.

**In the tailored set:**
- **Tracer-specific length of stay adjusted for differences in case mix**
- **Hospital-wide average length of stay adjusted for case-mix** (compare the global average length of stay to expected length of stay according to the DRG structure of the hospital and)

**Complementary measures:**
- **Transfer rate**
  - **Rationale:** transferred patients are excluded from the base indicator. This measure indicates if the median length of stay is computed on a representative sub-set of patients. It is also a proxy for case-mix. We can expect hospitals admitting a large proportion of patients from other acute care settings to attract more severe/complex patients.

**c. Related performance indicators**
- **Readmission rate (Core – Clinical effectiveness)**
  - **Rationale:** 1) Assess if early discharge has negative impact on patient outcomes. 2) Identify strategies to “cut-up” hospital stay for administrative reasons (artificial reduction of length of stay)
- **Return to the intensive care unit**
  - **Rationale:** Patients who return to the intensive care unit have been shown to have significantly longer length of stay.
- **Result of audit of discharge preparation (Core – Responsive governance)**
  - **Rationale:** unnecessary hospitalization days can be avoided by a timely and informative screening for likeliness to require services after discharge, by the timely commencement of the preparation of a discharge plan and by timely notification of community providers.
- **Patient satisfaction with discharge preparation (Core – Patient centeredness)**
- **Rate of day surgery (Core – Efficiency)**
  - **Rationale:** For tracer procedures that can be performed as day surgery, a higher rate of day surgery may serve as a proxy of the severity of patients has only patients in frail status or with complications will be operated on an inpatient basis.
- **For delivery: Breastfeeding at discharge (Core – Responsive governance)**
d. Exogenous variables

- **Patient factors**
  - Severity and comorbidities – stable/unstable condition.
  - Comment: In the tailored set, we propose to adjust length of stay according to risk factors. Risk adjustment models will need to be developed during the pilot phase of the PATH project. For several tracer conditions or procedures, the variable emergency / elective admission may be used as a proxy, to stratify patients with potentially very different outcomes in terms of length of stay.
  - Social support when returning home. This factor should be assessed early to insure proper discharge preparation. It may complicate somewhat return home.
  - FOR DIABETES PATIENTS: better glycemic control in Caucasians, older diabetic patients, patients with higher outpatient utilization; poorer glycemic control in minorities, patients with greater disease severity, longer duration of disease, more extensive comorbidity

- **Organizational factors:**
  - A high bed occupancy rate is a strong incentive to reduce lengths of stay.

- **Local factors:**
  - Occupancy rate of nursing home & rehabilitation beds in the area
  - Family and social support
  - Alternative resources such as home nurses

- **National / regional factor:**
  - Financial incentives for hospital (e.g. per diem, per admission, global budget), physicians, and patients

---

**e. Potential quality improvement strategies**

In this section, hospitals should describe strategies for

- Smooth patient process of care:
  - Clinical pathways
  - Coordination of care within organization to assure timely laboratory and diagnostic test and information transfer (and avoid redundancy)
  - Integration of care with the community (discharge preparation, including education)

- Clinical effectiveness

- Availability of less invasive techniques

- Pre-assessment clinics, early discharge preparation: identify patient at risk of requiring support at discharge, cooperation with other health care providers

- Diffusion of length of stay guidelines, clinical pathways, planning of operating room and technical departments to avoid “bottlenecks”, etc.

- Use of less invasive techniques (e.g laparoscopic vs open surgery) and pain management techniques

- Transfer policies

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1 Available on http://www.doh.gov.uk/nfs/diabetes/
4 Uchiyama K, Takifuji K, Tani M, Onishi H, Yamaue H. Effectiveness of the clinical pathways to decrease length of stay and cost for laparoscopic surgery
Efficiency: Length of stay

Efficiency: Inventory in stock

1. Definition

Full description: Average number of days inventoried supplies are held in inventory, for tracer categories

a. Numerator: Total value of inventory at the end of the year for pharmaceuticals

b. Denominator: Total expenditures for pharmaceuticals during the year / 365

c. Collection period: latest administrative year available

d. Comments:
   - Data on blood wastage is readily available. Hence, remove blood products from the definition of the indicator on inventory in stock and build a specific indicator for blood wastage. It is computed using 2003 data (latest administrative year available)
   - Surgical disposable equipment is removed from the original definition of this indicator
   - Include chemo-therapy drugs

Pharmaceuticals are purchased regionally.

2. Rationale – Justification for use

a. Burden:

Burden of high inventory in stock:
- Holding costs are directly proportional to inventory in stock. They are made up of interest, insurance, lost opportunity cost, depreciation, deterioration, obsolescence and handling cost.
- Pharmaceuticals, blood products and surgical disposable account for a substantial part of cost of supplies and they are directly related to hospital core activities. Depreciation, obsolescence and deterioration are a crucial concern for those products.

Burden of low inventory in stock:
- Cost of emergency overnight delivery because of shortage of supplies
- The burden of stock rupture is difficult to assess. It varies greatly depending on how essential is the product for patient care.

b. Importance – Prevalence – Potential for improvement:

- Cost of material management amounts approximately to 30 to 40 percent of operating dollars in a hospital. It has been estimated that around 50% of all the cost in the operating room are consumable supplies¹.
- Anecdotal evidence suggests potential for reducing inventory levels. In the United States, it was estimated that nationally, hospitals are incurring millions of dollars of unnecessary inventory holding cost in the range of 10% to 15% annually, because their storeroom and departmental inventories are being managed poorly or not managed at all. According to some, American hospital’s biggest problems lies in the storeroom, as hospitals have been slower than other industries to adopt money saving techniques logistic practices².
- We have no hard data to support this affirmation and it cannot be generalized to Western and Eastern European countries as holding costs and opportunities to reduce inventories are probably very contextual with wide variations between countries and regions.
- In Ontario³, the average number of days in stock greatly varies with a mean of 21.29 days and a variance of 19.46. Small hospitals have on average twice as much number of days in stock as community and teaching hospitals.

c. Hospital impact:
- Inventory management techniques have a strong impact on number of days in stock.
d. Validity:

| (1) Formative indicator of optimal use of capacity (Dim: Eff\textsuperscript{i}) |
| (2) To a lesser extent, reflective indicator of capacity to meet demand (if very low ratio) (Dim: RF\textsuperscript{ii}) |

**Strong rationale:** One purpose of inventory management is to ensure the availability of the items that the user needs in the quantity in which they need them. The other purpose is cost containment. Both purposes are (in-)directly addressed with the indicator. Holding cost is decreased by lowering inventory in stock but low inventory in stock may result in being out of stock and not being able to supply the users with items they require to perform proper care and it can ultimately negatively affect patient outcomes.

Inventory in stock provides a good indication of the quality of material management, as it is the outcome of many different processes encompassing forecasting demand, communication between departments (users and purchasers), ordering, monitoring levels of inventory, and organization of delivery. This indicator estimates the number of days worth of stock.

Low stock indicates either good inventory management either hospital has not the capacity to acquire the required material.

**Strong face validity and consensus on use:**

**Current use:** Included in Ontario Hospital Report.

This is a very common managerial tool used both in the private and public sectors, taught in many general management manuals. It has strong face validity for managers. Formal definitions vary slightly (average number turnover, number of days worth of stock) but the basic idea remains the same.

In the survey on indicators importance and relevance and data availability, Lithuania and Georgia indicated that they are currently using this indicator in their hospital. It is not used in respondent’s hospitals for Slovakia, Albania, Estonia, Finland, Ireland, Denmark, and France.

**Low construct validity:** We did not find any scientific literature in Medline database relating inventory in stock with other performance indicators. During our research, we came to the conclusion that many efficiency indicators are less well represented in literature and tend to be based primarily on empirical evidence and common managerial practices.

One study in Taiwan hospitals indicated a statistically significant relationship between processes (material management systems) and the outcome (stock turnover rates)\textsuperscript{4}.

**Strengths:** very strong face validity and rationale for use

**Limits:** no standard definition of pharmaceuticals, blood products, and surgical disposable equipment; difficult to interpret because there is no clear target and indicator may be explained by many factors

3. **To add meaning – Guide for interpretation**

When combined with total value in stock per patient day,

| Screening tool | X | Conclusion assm\textsuperscript{6} |

**a. Direction and targets:** In a reasonable range and from a cost efficiency point of view, lower inventory in stock is better. However, in hospitals with low inventory, implementing just-in-time inventory systems may not be the most cost-effective strategy and they could probably achieve better costs reduction by negotiating less expensive purchase prices. Moreover, if average inventory in stock is too low, hospital is at risk of not being able to answer the demand.

Targets vary depending on the type of supply, how crucial it is for patient care, minimum number of references in stock, random variation in demand, delivery delays from the suppliers, number of geographically dispersed sites.

\textsuperscript{1} Dimension: Efficiency

\textsuperscript{ii} Dimension: Responsive Governance
b. Stratification – alternative measures:

Proposed stratification:
- Stratify for pharmaceuticals, blood products, and surgical disposable equipment
- Compute specific indicator for the operating room because operating room supplies are both expensive and numerous and operating room storage space is the most costly space in the hospital.
- Identify supplies with greater cost through ABC technique and specifically focus on monitoring of those supplies

Potential complementary measures:
- Average delivery delay, for the same supplies categories as above
- Total value in stock per patient day, for the same supplies categories as above
- Increase or reduction of average value of stock per patient days compared to previous year

And also, for further scrutiny of outliers:
- Out-of-stock frequency
- Total waste due to depreciation, deterioration, and obsolescence per patient day
- Number of references/items hold in stock, for the same supplies categories as above

c. Related performance indicators:
- Hospital-initiated cancelled procedures on day of surgery (Tailored – Patient centeredness perspective on efficiency)
  ➢ Rationale: Rupture of stock for blood products or other essential supplies may force hospitals to cancel procedures. This indicator is more closely linked to inventory in stock specifically computed for the operating theatre (see proposed stratification above).

d. Exogenous variables:
- Hospital factors (degree of hospital influence depends on the context)
  - Size, due to economies of scale (proxy: number of bed)
  - Random variations in demand (proxies: proportion admissions through emergency care, proportion elective procedures)
  - Hospital mission probably influences the range and cost of supplies with, for instance, teaching hospitals requiring more rare high cost drugs than community hospitals
  - Enough resources to acquire supplies, availability of blood products (proxy: cost of supplies per patient day)
  - Degree of autonomy to purchase supplies and inventory management information systems
  - Delivery delays from the suppliers (to reduce the need for decentralized stocks)
  - Hospital dispersed on several site, with each site requiring its own inventory; delivery systems to users within the organization (proxy: number of geographically dispersed sites)
  - Proxy: Limit comparisons to peer group of hospitals with similar mission, e.g. teaching, community, small
- Country or regional factors
  - For pharmaceuticals: in some countries, pharmacies are not within hospital and patients have to buy their own medication

e. Potential quality improvement strategies:
In this section, hospitals should describe strategies to
- Reduction of cycle time, for instance negotiate short delivery delays with suppliers
- More efficient utilization of supplies in order to reduce the need to buy more:
  - Limitation to number of drugs/references through standardization committees or essential drug formulary,
  - Inventory control technologies such as bar-coding, scanning technology, organise central inventory
  - Consolidate constellation of inventory locations and control “unofficial” or secondary inventories maintained in users areas
  - Improved supply forecasting (predict supply usage)

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1 Amendolair D. Material management in the operating room. Operating Room Topics. Available on www.infectioncontroltoday.com/articles/0c1topics.html
Efficiency: Inventory in stock

Efficiency: Intensity of use of surgical theatre

1. Definition

a. **Numerator**: Number of patient hours under anesthesia

b. **Denominator**: Number of theatres * 24 hours

c. **Comments**:
   - Unit of measurement of the proposed indicator (surgical theatre unused session) is unclear and varies (hours/time, theatre use, and salaries) and hence the definition has been changed by the working group

d. **Data collection**:
   - Data is not readily available
   - Data will be collected prospectively over 1 week during April-May 2004
   - Report on both elective and emergency surgery
   - Delivery room is left for local determination for each country to report on or not (separately, if possible)

Recovery room are not counted as surgical theatres

2. Rationale – Justification for use

a. **Burden**:
   - The operating room is a high cost department within hospitals. Considerable resources are wasted if operating room is not used effectively.
   - Effective management of operating room is paramount when operating room is a “bottleneck”. By increasing use of operating room, patient flow improves and waiting list can be reduced.

b. **Importance – Prevalence – Potential for improvement**:
   - No data available on trends and potential for improvement

c. **Hospital impact**:
   - Indicators are very sensitive to planning (scheduling and forecasting) and coordination of care (pre-operative preparation)
   - Unused sessions are related to cancellation of booked procedures
   - Illustration: During the National Demonstration Hospital Program, operating room utilisation improved by 3.2% overall with more than half achieving more than 90% utilisation; lead hospitals improved by 5% to an average 95% utilisation

d. **Validity**:

| Direct measure of optimal use of capacity (Dim: Eff) |
| In some contexts, impacts on access (Dim: RG) |
| To a lesser extent and in some contexts, reflects reputation, market share, volume (Dim: RG) |

**Very strong rationale**: Analysing the operating room utilisation trends allows rescheduling of elective operating sessions so that all units achieve optimal utilisation. This is only possible if the data is closely monitored and if reasons for low utilisation rates and/or high rate of unused sessions are investigated.

**Little consensus on use**: This indicator was used in the Australian National Demonstration Program for best practice in elective surgery. The performance assessment systems studied do not use this indicator. Neither did we find evidence on the potential use of this indicator.

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1 Dimension: Efficiency

2 Dimension: Responsive governance
Efficiency: Intensity of use of surgical theatre

CCL:

**Strengths:** strong rationale for use, potential relationship with other indicators of performance to increase content validity of the set as a whole, forces hospitals to monitor operating room utilization

**Limits:** no evidence of validity of the indicator, great concerns regarding reliability across countries and burden of data collection

3. To add meaning – Guide for interpretation

When combined to rate of admission after day surgery:

| Screening tool | X |  |

a. **Direction and targets:** Higher rate is better. Though, an extremely high rate may trigger concerns regarding access for emergency patients.

The Australian National Demonstration Program targeted an operating room utilization rate of 80-85% and exceeded this target.

b. **Stratification – alternative measures:**

**Alternative indicators in Tailored set:**

1. **Occupancy rate:** anaesthesia start to time left operating room / operating session time allocated
2. **Surgical utilization rate:** surgery start to surgery finish / operating session time allocated

**Definitions:**
- **Anaesthesia start:** is measured from when the anaesthetists actually commences doing something relevant to the case, e.g. drawing up of drugs, checking machine
- **Surgery start:** is measured from when skin preparation begins or when specialised positioning of the patient begins, whichever occurs first
- **Surgery finish:** surgery is considered ended when the dressings are applied

**Stratification:**
Distinguish operating rooms dedicated to one-day case surgery as they face different constraints and are usually exclusively used for elective procedures.

**Background measures:**
- Total number of sessions planned per day
- Total number of hours operating room staffed for elective interventions

c. **Related performance indicators:**

- Hospital-initiated cancellations of procedures on the day of surgery (Tailored – Patientcenteredness perspective on efficiency)
  - **Expected relationship:** Both indicators are outcomes of the management of patient flows in the operating theatre. We expect them to be positively correlated. Disorganized operating room and poor scheduling of patients results in cancellation of procedures and unused sessions. On the other side, very tight patient scheduling does not leave room for unexpected events during surgery and we can expect more cancellations as a result.
  - Day surgery rate (Core – Efficiency)
    - **Rationale:** Operating rooms dedicated to day surgery have a different organization and face different constraints. Usually, they are exclusively reserved for elective cases and only very rarely accept emergencies.
d. **Exogenous variables:**

- **Hospital factors** (degree of hospital influence depends on the context):
  - Proportion emergency surgical interventions, type of procedure
    \[\Rightarrow\] Stratify by specialties, limit comparisons to urban/rural context (=proxy for emergencies?)
  - Surgeons degree of autonomy in hospital, involvement in management, financial incentives for better utilization of operating room
  - Median waiting time

- **Country or regional factors**
  - The utilization rate is affected by national legislation on hygiene (and hence preparation time of operating room between surgeries)

**e. Quality improvement strategies:**

- System to track and investigate reasons for cancellations of interventions
- Implementation of an operating theatre management system to monitor operating room utilization

**4. Data collection issue**

Questions to discuss during 1st workshop on pilot implementation of PATH:

- Compare current data to monitor operating room utilization and information systems in the operating theatre
- Alternatives:
  1) Continuous data collection (information system automatically records required information)
  2) Retrospective/prospective audit over a limited period
- Compare methods to schedule operating sessions
- Compare estimates of occupancy rates

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1 Complementary measure to the indicator “variance in time on waiting list for selected tracer procedure” (Core – Responsive Governance – Equity)
Descriptive sheets for PATH core set Staff orientation indicators

Descriptive sheets are provided for indicators proposed for inclusion in the core set. First, operational definition is presented. Then, evidence to support the use of the indicator is gathered. Descriptive sheets provide information on hospital potential impact and responsiveness to measurement, prevalence, validity, and reliability. They also support potential users in interpreting the results, when the indicator is implemented.

Sheet 1: Budget for health promotion activities aimed at staff
Sheet 2: Absenteeism
Sheet 3: Work-related injuries (occupational percutaneous exposure (PCE) and mucocutaneous exposures (MCE) to blood or potentially infective biological fluids
Sheet 4: Excessive hours worked
Sheet 5: Training expenditure
Staff orientation: Budget for health promotion activities aimed at staff

1. Definition

a. Numerator: direct cost for all activities dedicated to staff health promotion (as per list) set up in 2003.
b. Denominator: total salary expenditures
c. Definitions:
   - According to the WHO Ottawa Charter, “Health promotion is the process of enabling people to increase control over, and to improve, their health”
   - Areas of health promotion activities: 1) health screening, 2) promoting healthy behaviour, 3) organizational interventions, 4) safety/physical environment, 5) social and welfare. Illustrations: worksite smoking cessation programs, stress –related programs, musculoskeletal disorders, alcohol cessation activities, nutrition and physical exercise.
d. Inclusion criteria:
   For the purpose of this indicator, we only include area 2. Areas 3 and 4 (indirectly) deal with staff safety indicators such as % job descriptions with risk assessment of job and work-related injuries (percutaneous injuries or mucocutaneous exposure). Health screening is also excluded.

2. Rationale – Justification for use

a. Hospital influence:
   Depends on the degree of freedom to allocate funds within hospitals greatly vary between countries and public/private status and the available total budget. It also depends on National policies and legislation on health promotion within the Workplace
   Potential adverse effect: If hospitals are evaluated merely on the budget for health promotion activities and not on the volume and quality of health promotion activities that are set up, they might as well just define a budget without being convinced of its usefulness nor without really ever using it, but just to show off.

b. Prevalence and potential for improvement: Little data is available on the extent of health promotion activities within hospitals. A survey in a sample of more than 1400 companies in seven European countries indicate that “activities which might be regarded as coming from the health promotion arena (e.g. eating, alcohol or smoking policies) tend to take place rarely”1

c. Validity:

| Reflects concern for staff health (Dim: SO/RG) |
| Impacts on staff health (Dim: SO²) |

Good face validity:
- Public policies supporting health Promotion in working setting:
  • Luxembourg Declaration on Workplace Health Promotion
  • World Health Organization “Healthy Workplace” initiatives
  • Cardiff Memorandum on Workplace Health Promotion in Small and Medium Sized Enterprises

Unknown construct validity: no evidence to support the impact of defining a health promoting budget on extent and quality of health activities. And extremely little evidence is available on the impact of health promotion activities on staff health, except for anecdotal “success stories” in general settings (not hospital-specific).

---

1 Dimension: Staff orientation on responsive governance
2 Dimension: Staff orientation
However, even if the activities do not produce the expected results, their implementation can be viewed as a concern for staff health and hence a staff orientation. Moreover, it is crucial to include some measure of health promotion for the content validity of the indicator set as a whole.

**Strengths**: strong policy support and from international experts, improves content validity of the set as a whole

**Limits**: very little evidence to indicate the definition of a specific budget for health promotion and no evidence support its impact on staff health

1. **To add meaning – Guide for interpretation**

   **Direction and targets**: larger budget is preferred but having defined a distinct budget for health promotion activities is already indicative of a concern for health promotion, even if extremely low.

   **Stratification – alternative measures**:  
   **Alternative**: Direct cost for health promotion activities

   **Stratification**:  
   - According to area of health promotion (see definitions above)

   **Related performance indicators**:  
   - Short and long-term absenteeism  
   - Percutaneous injuries (and extension to other occupational injuries)

   **Quality improvement strategies**:  
   - List process to define health promoting budget and stakeholders interventions in the process  
   - List process to select health promotion activities to be undertaken  
   - List health promotion activities undertaken  
   - Specify target audience  
   - Specify number of persons who attended/benefited from health promotion activities as defined above

2. **Data collection issue**

   The main concerns that no specific budget is defined in a vast majority of hospitals. Definition of the best denominator is unclear.

---

Staff orientation: Absenteeism

1. Definition

a. **Numerator**: Number of days of medically or non-medically justified absence for less seven days or less in a raw (short-term absenteeism) or 30 days or more (long-term absenteeism), excluding holidays, among nurses and nurse assistants

b. **Denominator**: Total equivalent full time nurses and nurses assistants * number contractual days per year for a full-time staff (e.g. 250)

c. **Definitions**:
   - Short-term absenteeism: from 1 to 7 days (version 1) and from 2 to 7 days (version 2)
   - Long-term absenteeism: more than 30 days to 1 year

d. **Stratification**
   - Collect data by age, sex and qualification (nurse or assistant)
   - Age categories: under 40, 40-55, over 55 years

e. **Exclusion criteria**:
   - This indicator is measured only for nurses and nurse assistants. Administrative and support staff and physicians are not considered.
   - For long-term absenteeism, maternity leaves, including preventive leaves, are excluded because of different legislations and it is out of hospital’s influence (though in some instance, staff is relocated to activities compatible with pregnancy and preventive leave and hence long-term absenteeism is avoided).
   - However, sick leave during pregnancy is included.

Data collection: retrospective longitudinal administrative data for calendar 2003

2. Rationale – Justification for use

a. **Burden**:
   - Negative impact of absenteeism:
     - Cost to compensate for lost of working hours, increased workload for the remaining staff, lost productivity, lower quality if highly skilled personal providing essential services cannot be replaced
     - Short-term absence is most disturbing because of its unpredictable nature and it allows less time to adjust schedule, take steps to replace absent worker, etc.
   - Positive impact of absenteeism:
     - Short-term absenteeism can be an effective coping strategy in the presence of stressful conditions
     - “Working through” illness: Incidence of employees attending work despite being ill is increasing in CIS countries, mainly because of fear of dismissal or financial motivations (loss of earnings)

b. **Importance – Prevalence – Potential for improvement**:
   - In Europe, the absenteeism rate (including temporary and permanent work incapacity) ranges from 3.5% in Denmark to 8% in Portugal.
   - In Canada, average absenteeism rate is equal to 8.1% for nurses. It is 80% higher than the average rate for 47 other occupation groups at 4.5%. According to CIHI, other health care workers are only half as likely to be absent from work as are nurses. Nurses are a high-risk group for emotional exhaustion and musculoskeletal injuries.
   - On the other hand, incidence of employees attending work despite being ill is increasing in CIS countries, mainly because of fear of dismissal or financial motivations (loss of earnings).
   - Comment: Rates described above give a rough estimate as definitions and inclusion criteria greatly vary between studies
### Staff orientation: Absenteeism

**c. Hospital impact:**
- In a meta-analysis of 99 studies on 12 type of absence interventions, a number of interventions proved useful in reducing absenteeism: employee assistance programs, training and goal setting programs, policy changes to increase employees’ accountability for their absence, scheduling changes such as flexible time, and games or token economies.
- Situational predictors of absenteeism such as organisational permissiveness, role problems, pay, and job characteristics are partly under hospital’s sphere of influence.

**d. Validity:**

<table>
<thead>
<tr>
<th>More specifically for short-term absence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Impacts on cost-efficiency (Dim: Eff)</td>
</tr>
<tr>
<td>2. Reflects organizational commitment, job involvement, morale, and job satisfaction (Dim: SO)</td>
</tr>
<tr>
<td>3. Impacts on quality of care (Dim: CE and PC/SO)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>More specifically for long-term absence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Reflects ill-health (Dim: Saf./SO)</td>
</tr>
</tbody>
</table>

**Also:**
- Is influenced by health promotion activities (Dim: SO)

### Face validity:

1. **Efficiency:**
   - Absenteeism is very costly in terms of compensation paid for lost hours at work and greater reliance on temporary or agency staff and overtime hours.
   - It is an indirect indicator for staff productivity as both staff productivity and absenteeism are influenced by the same factors.

2. **Staff orientation:**
   - **Theoretical models** strongly support a relation between absenteeism and job satisfaction and work constraints (see appendix).
   - **Demonstrated relationships** with other indicators of performance: job characteristics and work stress (control over work, work overload and pressure, participation in decision-making), teamwork and social support, overtime, poor management style – Antecedent to turnover – Mixed evidence on relationship with job satisfaction.

3. **Quality of care**
   - Conventional wisdom assumes that “happy staff makes happy patients”. In the services sector, satisfaction of staff is closely related with satisfaction of clients because of the interaction between staff and clients. Burnout strongly impacts on absenteeism. It is signaled by high level of depersonalization and hence deteriorates staff attitudes towards the patient.
   - When a nursing unit receives a last minute sick call for the upcoming shift, it is often very difficult to timely replace the absent workers and impacts on quality and continuity of care.

4. **Staff safety (ill-health)**
   - **Strong consensus on use:** Absenteeism is often used to measure of the impact of preventive and rehabilitation programs or interventions aimed at improving ergonomics and working environment. In many studies it is also used as an indicator of importance of health-related variable under study.
   - Musculoskeletal injury (low back pain) and mental health disease are very frequent justifications for long-term absenteeism. They are closely related to working conditions. Musculoskeletal injury and more specifically occupational low back pain are the predominant causes of disability due to work-related conditions. We suppose that other chronic conditions or acute diseases not related to working environment should be uniformly distributed among hospitals and should
Staff orientation: Absenteeism

not affect ranking, if controlled for age and sex of staff. In other words, there is no evidence of a selection bias resulting in more frail staff concentrated in a few hospitals.

- **However**, it is important to distinguish between ill health and absenteeism\(^2\) because
  - Not all activities aimed at reducing workplace absenteeism have an effect on health employee
  - There are employees with health problems who are not absent at all.

(5) Health promotion activities
- Health promotion activities are aimed at improving staff health and hence should ultimately result in improved health and lower absenteeism. For instance, influenza immunization is a widespread cost-effective health promotion activity that has direct impact on absenteeism.

Construct validity:

**Very good evidence** on the relationship between absenteeism and other performance indicators such as working conditions, job content, staff satisfaction, health promotion activities (see appendix).

| Strengths: | high burden, extremely relevant to health sector, strong theoretical support and demonstrated relationship with practice environment, job satisfaction, morale, job involvement |
| Limit: | variability of definitions and low reliability of data in some countries, more relevant to countries where job security is guaranteed |

3. To add meaning – Guide for interpretation

a. **Direction and targets**: Lower absenteeism is usually better. However, extremely low absenteeism rates may indicate fear of dismissal or other reprisals or raise concerns regarding data quality

b. **Stratification – alternative measures**:

**Alternative units of measurement**:
- Proportion working days (working days lost due to absence/total working days)
- Absence frequency rate
- Median duration of absence
- Proportion of short-term absence (total days of short-term absence/total days of absence)

**Other related measure**:
- Temporary or agency work

**Stratification**:

Within short-term absence
- Medically justified or not

Within long-term and short-term absence
- Professional category (distinguish nurses)

**Alternative (complementary) indicators**:
- Short-term absence frequency rate
- Median duration of absence
- Proportion of short-time absence over total absence
- Proportion of short-term absence medically justified

**For further scrutiny and for internal use**, we recommend hospitals to monitor
- Monthly
- At the department level
- For reasons (if indicated)
c. Related performance indicators:
- Work-related injuries (Core – Staff safety)
- Overtime or excessive hours (Tailored – Staff safety)
- Length of stay (Efficiency – core basket)
- Patient satisfaction/experience with nursing care and Global patient satisfaction (Core – Patient Centeredness)
- Budget for health promotion activities aimed at the staff (Core – Staff orientation and responsive governance)

d. Exogenous variables:
- **Staff factors**
  - Demographics: age, sex, marital status, children
  - Proportion of full-time staff
  - Tenure
  - Professional category
  - Attitudinal predictors, personality traits, e.g. absence culture or “absence-proneness”.
  - Chronic health conditions and habits: smoking, substance abuse, depression, lack of exercise
  - Acute health (colds and flu, family illness, pain). However, mediating factors are 1) somewhat related to stress, 2) believed to be somewhat controlled for with adequate interventions, and 3) varying thresholds for taking sick leave
  - Negative or positive life events (e.g. death of relative, wedding, etc.)

- **Hospital factors** (degree of hospital influence depends on the context):
  - **Staff ratios**
    Expected relationship: Staff ratios are supposed to have a very strong impact on absenteeism because they are one of the major determinants of job environment, job content and objective workload. Job strain negatively impacts on more ill health, staff satisfaction and involvement. On the other hand, staffing levels may be so tight that employees feel they have to show up even sick because they cannot let their colleagues down.

- **Country or regional factors**
  - Absence culture at society level: values and beliefs of the larger society and its subcultures
    - **Proxy:** Average absence rate
  - Loss of income in case of temporary leave. For instance, in EU countries and Norway, benefit levels range from 50% to 100%. In CIS countries, loss of income aggravated by reliance on informal, out-of-packet gratitude payments
  - Medical certificate needed (13 out of 16 EU countries)
  - Downsizing in the health sector and fear of losing job
    - **Proxy:** Vacancy rate unemployment rate in the area for the professional category
  - Social support for family (e.g. sick parents or children)
    - **Proxy:** Socio-demographic variables in the area
e. **Quality improvement strategies:**

Open questions (use EFILWC framework):

- List strategies tackling health problems of employee (or family):
  1. Promoting the health and well-being of employees,
  2. Improving work environment and safety,
  3. "Family-friendly" practices (e.g. childcare for sick children)

- List strategies improving motivation at work and implication:
  1. Change in “absence culture” (what is believed to be “acceptable”),
  2. Training and goal setting programs,
  3. Absenteeism feedback on employee absence behaviours,
  4. Flexible working time

- List repressive strategies:
  1. Control of absenteeism,
  2. Checks on absent workers

- List strategies to facilitate return to work after long term-absenteeism, employee assistance program
  1. Adapt schedule
  2. Adapt working environment
  3. Adapt job content
APPENDIX

A. Theoretical models

Two streams of theoretical models are found in the literature (Johns 1997). They support mediated or direct effect of staff satisfaction on absenteeism (Goldberg and Waldman 2000):

- Absenteeism is a behavioral response to job dissatisfaction,
- Absenteeism is related to demographics and work (including job characteristics) and non-work constraints and not a direct response to job dissatisfaction

A missing link to examine job satisfaction and absenteeism could be trust and mutual respect within employment relationship and cultural salience. According to Nicholson and Johns (1985, in Gellatly and Luchak 1998) “under high cultural salience, attendance behavior should be under normative control, whereas, individual factors (e.g. job dissatisfaction) should play a greater role in determining absence when cultural salience is low”. In their theoretical model, Blau and Boal (1987) skip job satisfaction to replace it with organizational commitment and job involvement. A middle-approach consists in including the three concepts with job satisfaction having an indirect effect through organizational commitment and job involvement (Brook 1986).

Mediated (M) and direct effect (D) only models of absenteeism (in Goldberg and Waldman 2000)

- Job characteristics and work stress:
  - Results of job content questionnaire (measures psychological demands, job decision latitude and social support at work) are associated with both medically certified and non-certified sickness absences among nurses in Bourbonnais and Mondor (2001). A large proportion of sick leaves are motivated by a diagnosis “potentially related to the psychosocial environment” and a subsequent proportion of absences in this categories occur for mental health problems.

- Teamwork: teamwork is the work-related factor with greatest impact on absenteeism in Kivimäki et al. (2001). Physicians working in poorly functioning team were at increased risk (OR: 1.8) of taking long spells of absence than physicians working in well functioning teams. In this study, the other work-related factors significantly associated with physician absence were overload, heavy on call responsibility, and poor job control.
Staff orientation: Absenteeism

- **Overtime:** In Ontario, the probability of a hospital having a high RN lost-time claim rate was found to be increased with registered nurses working more than one hour of overtime per week\(^{28}\) (Shamian et al. 2003).

- **Health promotion activities:**

  Table 1: Other job work factors (adapted from a review of the literature by Michie and William 2003)\(^{39}\).

<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Participants</th>
<th>Response rate</th>
<th>Work factors</th>
<th>Outcome</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rees and Cooper 1992</td>
<td>Cross sectional</td>
<td>1176 health care workers, UK</td>
<td>67%</td>
<td>Control over work</td>
<td>Sickness absence</td>
<td>No association</td>
</tr>
<tr>
<td>Brooke and Price, 1989</td>
<td>Cross sectional</td>
<td>425 hospital workers, USA</td>
<td>74%</td>
<td>Routinisation, centralization, pay,</td>
<td>Absenteeism</td>
<td>High role ambiguity and tolerance of absenteeism, low pay and low centralization predicted absenteeism (structural coefficients: 0.21, p&lt;0.001, 0.27 p&lt;0.01, -0.11 p&lt;0.05, -0.19, p&lt;0.02)</td>
</tr>
<tr>
<td>Gray-Toft &amp; Anderson, 1985</td>
<td>Experimental</td>
<td>159 nurses, USA</td>
<td>Not reported</td>
<td>Open, supportive supervisory style</td>
<td>Absenteeism</td>
<td>Open supportive supervisory style associated with lower absenteeism</td>
</tr>
<tr>
<td>Landerweerd &amp; Baumans, 1994</td>
<td>Cross-sectional</td>
<td>561 nurses, NL</td>
<td>96%</td>
<td>Work pressure, job complexity, feedback, autonomy, promotion/training</td>
<td>Absence frequency</td>
<td>Work pressure associated with absence frequency (B=0.12) and promotion/training negatively associated (B=-0.12)</td>
</tr>
<tr>
<td>Smulders and Nijuis 1994</td>
<td>Cross sectional and prospective</td>
<td>1755 male public sector workers, NL</td>
<td>70%</td>
<td>Job control and job demand</td>
<td>Absence rate and frequency</td>
<td>Cross sectionally, job control associated with low absence frequency(beta=0.10, p&lt;0.01) and demand associated with low absence rate (beta=-0.08, p&lt;0.05)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Participant</th>
<th>Variable</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price &amp; Mueller 1986</td>
<td>Retrospective (absence) and longitudinal (satisfaction)</td>
<td>948 hospital employees, including nurses</td>
<td>Job satisfaction and turnover</td>
<td>No relationship found between job satisfaction and absence</td>
</tr>
<tr>
<td>Ng 1991</td>
<td>Retrospective (absence) and cross-sectional (satisfaction)</td>
<td>182 nurses</td>
<td>Job satisfaction</td>
<td>No difference in job satisfaction on staff on wards with high and low absence</td>
</tr>
<tr>
<td>Matrunola 1996</td>
<td>Retrospective (absence) and cross-sectional (satisfaction)</td>
<td>30 nurses</td>
<td>Job satisfaction &amp; demographic variables</td>
<td>No relationship found between job satisfaction and absence. No significant relationship for demographic variables eg. age and grade and absence neither.</td>
</tr>
</tbody>
</table>

Michie and William (2003)\(^{31}\) provide an extensive review of the literature on mental health outcomes and work factors. They concluded that “

- **Key work factors associated with psychological ill health and sickness absence are** long hours worked, work overload and pressure, and the effect of these on personal lives; lack of control over work; lack of participation in decision-making; poor social support; and unclear management and work role

- **There is some evidence that sickness absence is associated with poor management style**”

We reported in the table above only studies where ill health was measured through absenteeism or sickness absence (review of the literature by Gauci Borda and Norman 1997\(^{32}\)).

- Job satisfaction: unclear relationship.
- Antecedent to turnover
- Kinship responsibility identified as antecedent of absence and intent to stay
Staff orientation: Absenteeism


3 European Foundation for the Improvement of Living and Working Conditions – European Foundation for the Improvement of Living and Working Conditions 1997

4 CNCA report 2001 in Shamian et al. 2003 (see ref. 14 below)

5 Canadian Institute for Health Information, 2000 in Shamian et al. 2003 (see below)


7 Unckless et al. 1998


9 Dimension: Efficiency

10 Dimension: Staff orientation

11 Dimension: Clinical effectiveness

12 Dimension: Patient centered perspective on staff orientation

13 Dimension: Safety perspective on staff orientation

14 Johns 1997


20 European Foundation for the Improvement of Living and Working Conditions 1997


Staff orientation: Work-related injuries
Occupational percutaneous exposure (PCE) and mucocutaneous exposures (MCE)
to blood or potentially infective biological fluids

1. Definition

a. Numerator: Number of case of percutaneous injuries reported in the official database or occupational medicine register in one year (includes needlestick injuries and sharp devices injuries)
b. Denominator: Average number of full-time equivalent staff and non-salaried physicians
c. Exclusion criteria: None
d. Data source: Routinely collected data in 2003 in 1 of the 2 databanks mentioned above

e. Comment: Encourage one-point survey for data quality control

2. Rationale – Justification for use

a. Burden:
   - Exposure to serious and fatal infections from blood borne pathogens such as for instance HIV, hepatitis B and C has severe impact on exposed staff health, even if the disease is not contracted.
   - Probability of contracting hepatitis B, hepatitis C and HIV, from an infected patient, per needlestick, is estimated to respectively 30.00%, 1.80% and 0.30%\(^1\).
   - Exposure to blood borne pathogens results in a very high worker anxiety and distress\(^2\). Emotional distress can be severe and long lasting even if injury does not result in transmission of a severe disease. It can also extend to colleagues and family members.
   - Post-exposure treatments for HIV and hepatitis B have unpleasant side effects.
   - Direct cost of medical follow-up for at-risk exposure as been estimated in a range from 265 $ to 1,232 $ in two large hospitals in the US\(^3\). The cost includes 1) lab charges for blood tests; 2) charges for treatments such as hepatitis B immunoglobulin, hepatitis B vaccine, chemoprophylactic drugs for HIV, and tetanus vaccine, 3) service charges for emergency department or employee health department visits or other services; and 4) other costs such as surgery. Other cost includes lost time for the exposed worker.

b. Importance – Prevalence – Potential for improvement:
   - The Centers for Disease Control and Prevention estimate to approximately 384,000 percutaneous injuries occurring in US hospitals, with about 236,000 resulting from needlesticks involving hollow-bore needles. Those estimates are adjusted for under-reporting.
   - In Switzerland (7 hospitals)\(^4\), the following self-reported incidence rates of percutaneous injury with material contaminated with blood or biological fluids were reported in a 1995 survey:

<table>
<thead>
<tr>
<th></th>
<th>Last workday</th>
<th>Last work month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurses</td>
<td>0.49 %</td>
<td>2.23 %</td>
</tr>
<tr>
<td>Surgeons</td>
<td>4.28 %</td>
<td>11.05 %</td>
</tr>
<tr>
<td>Anesthesists</td>
<td>2.11 %</td>
<td>3.14 %</td>
</tr>
<tr>
<td>Domestic personnel</td>
<td>0.11 %</td>
<td>0.17 %</td>
</tr>
</tbody>
</table>

   - Among Danish hospital employed physicians\(^5\) the risk per person per year (incidence rate) was estimated from 6.2-8.5 for PCE and 7.3-8.8 for MCE in highest risk specialties to 0.8-1.3 for PCE and 1.3-2.9 for MCE in lowest risk specialties. Only 35% physicians adhered to universal precautions and non-compliance with universal precautions was and non-compliance was associated with a considerably increased risk of both MCE and PCE, especially in non-surgical specialties.
   - Note: it is difficult to compare rates because of varying definitions and methods

c. Hospital impact:
   - The US General Accounting Office (GAO)\(^6\) estimated that 75% needlestick injuries were preventable
      • by eliminating unnecessary use (25%)
      • by using needles with safety features (29%)
      • by using safer work practices (21%)
Staff orientation: Work-related injuries
Occupational percutaneous exposure (PCE) and mucocutaneous exposures (MCE)
to blood or potentially infective biological fluids

d. Validity:

| 1 | Reflects safe working conditions |
| 2 | Impacts on staff health (Dim: Saf/Staff\(^i\)) and more specifically on mental health and morale (Dim: Staff\(^ii\)) |
| 3 | Impacts on costs (Dim: Eff\(^iii\)) |
| 4 | Reflects responsibility towards staff (Dim: RG/staff\(^iv\)) |

**Strong rationale:**
Rationale for use lies mainly on the fact that most injuries can be prevented by using safety devices and by organizational arrangements. Hence, it is believed that incidence rates are indicative of management’s support to safety initiatives.

**Great consensus on use:**
In one study\(^7\) on 40 units in 20 hospitals indicated that nurses from units with low staffing and poor organizational climates are generally twice as likely as nurses on well-staffed and better-organized units to report risk factors, needlestick injuries or near misses.

**Some construct validity:**
Process: In Aiken et al. (1997)\(^8\), working in hospitals characterized by professional nurse practice models and taking precautions to avoid blood contact was significantly associated with fewer injuries among nurses. Needlestick injury has been demonstrated to be significantly associated with work environment characteristics (e.g. time pressure of work).

**Low reliability:** Reliability is a prerequisite for validity. In occupational disease and injuries, low reliability of reporting is a major concern. Data can be obtained either from institutional declaration reports either from retrospective (e.g. question: “report in detail on percutaneous injuries that occurred or almost occurred the last workday and the last working month”) or prospective (e.g. documentation for every-shift during a 15 or 30 days period) surveys. For instance, in a Swiss study, declaration rates of percutaneous injuries within seven Swiss hospitals were under-reported in comparison with retrospective survey (1 day and 1 year): 39.7% for nurses, 3.4% for physicians, 87.9% for domestic personnel\(^9\).

Reporting is hindered by lack of knowledge of appropriate procedures to follow after injury has occurred; fear of punitive employer response; time constraints; and perception that a low risk of transmission is associated with certain type of injuries, or patients, or both.

In a survey in 11 countries on data availability and quality, respondents evaluated data on workplace injuries of medium to excellent quality:
- Excellent quality (10/10): Lithuania, Estonia, Slovakia, Finland
- Quite good quality (8/10): Ireland
- Medium quality (5/10): Denmark

**Strengths:** high burden, strong hospital impact, sends a crucial message to monitor the issue

**Limits:** low incidence, very low reliability

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\(^i\) Dimension: Safety perspective on staff orientation
\(^ii\) Dimension: Staff orientation
\(^iii\) Dimension: Efficiency
\(^iv\) Dimension: Responsive Governance perspective on staff orientation
Staff orientation: Work-related injuries
Occupational percutaneous exposure (PCE) and mucocutaneous exposures (MCE) to blood or potentially infective biological fluids

3. To add meaning – Guide for interpretation

<table>
<thead>
<tr>
<th>Screening tool</th>
<th>X</th>
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</tr>
</thead>
</table>

Extremely high caution is recommended when interpreting the results because of the low reliability of injury reporting.

a. **Direction and targets**: Theoretically Lower rate is better. But due to low reliability, a low rate might be indicative of low reporting and not of low occurrence. It might indicate that there is no formal procedure to report incidents or that workers are not educated/motivated/confident to report incidents. Hence, a higher rate may indicate more concern for percutaneous injuries and a closer monitoring of the issue. The incidence rate may not be interpreted in isolation. It needs to be complemented with a description of reporting procedures (see open questions below).

b. **Stratification – alternative measures**:

Alternative measures related to exposure to blood or potentially infective biological fluids:
- Numerator:
  - Alternative 1: Number of percutaneous injuries or near misses
  - Alternative 2: Number of percutaneous and mucocutaneous exposures to blood or potentially infective biological fluids (includes contamination of intact skin)
- Denominator:
  - Alternative 1, BY TYPE of OCCUPIED BED: Average number of occupied beds
  - Alternative 2:, BY TYPE of DEVICE : # of device purchased during the period

Complementary measures with a wider scope to include more occupational injuries:
- Sickness absence days resulting from a work-related incident (e.g. assault on staff or fall). Limit to include only absence days resulting from work-related incident and do not include occupational injuries/disease (low back pain, depression, etc.) because of very low reliability.
- Sickness absence resulting in insurance claims
  - Number days lost per EFT or incidence rate or cost per EFT) (only for national comparisons because of varying rules and conditions to claim for occupational injuries and conditions among countries)

For better understanding, stratify by
- Professional category
- Area of care: ICU, operating theatre, emergency, surgical, medical department), time (or weekdays Vs. weekends, daytime Vs. night)
- Years of work experience (by broad categories to be defined, e.g novice, experimented)
- Type of device

Compare results from anonymous retrospective survey and from organization’s formal reporting scheme.

For further scrutiny: Staff survey to evaluate whether exposed staff is aware of the steps to take when injured by a needlestick and to evaluate knowledge and practices of prevention strategies

Background information: Estimation of prevalence among patients of HIV, hepatitis B and hepatitis C.

c. **Related performance indicators**:
- Related indicator in staff safety dimension (customized basket): Risk assessment of jobs
  - Expected relationship: both positive and negative – Risk assessment of jobs are supposed to lead to awareness and prevention strategies and hence lower incidence of percutaneous injuries. But, on the other side, increased awareness is supposed to result in higher reporting rates.

d. **Exogenous variables**:
- Specialties or department and type of intervention
- Experience (e.g. for physicians, employment as a senior or junior)
e. Quality improvement strategies:

- Open questions:
  - Written protocols for prompt reporting, evaluation, counselling, treatment, and follow-up.
  - Procedures implemented to improve reporting of work-related injuries
  - Risk assessment programs
  - Monitoring and analysing situations when injuries occurred
  - Education and training on safe handling and disposal of sharp devices
  - Needlestick injury prevention programs (for instance, see http://hsc.virginia.edu/medcntr/centers/epinet/checklt2.pdf), including description of Safety devices used (for instance, disposable syringes)
  - For instance, a 1991 US law “The Needlestick Safety and Prevention Act” requires employers to 1) review exposure control plans each year to keep up to date on new technology to prevent injuries; 2) involve non managerial workers in evaluating and selecting safety engineering devices; 3) maintain an injury log noting the type and brand of devices involved and the location and description of the incident. Compliance with those structural indicators is evaluated by the JCAHO since 2002.

4. Data collection issue

For comparisons in PATH project, we support retrospective or prospective surveys. If similar surveys are used throughout PATH participants, we expect much less variability than in institutional reports of declaration.

For internal monitoring and for supporting a safe practice environment, it is crucial to ensure within each hospital that staff reports all incidents and near-misses and that all reports are acted upon.

Hence, PATH advocates both approaches to be used simultaneously. High declaration rate by comparisons to survey rate is also an indicator of quality. It can be interpreted as a sign that staff is aware of declaration procedures and supported in this. If no data on percutaneous injury or near miss is readily available, this indicator sends the message that it is crucial to monitor it. Main issues is not around burden of data collection –because data should theoretically be collected anyway– but around the reliability of data, especially for international comparisons –because of the very different approach and incentives for reporting work-related injuries.

**Questions to discuss during 1st workshop on PATH implementation**

1. Discuss strengths and limits of potential data sources:
   - Prospective or retrospective self-reported injury and conditions surveys
   - Institutional reports
   - Insurance claims

2. Compare institutional reports between participating hospitals and also with the Exposure Prevention Information Network (EPNet). This system was developed to provide standardized methods for recording and tracking percutaneous injuries and blood and body fluids contacts. It is currently used in more than 1500 hospitals in the US and in Canada, Italy, Spain, Japan and the UK. Participants to the workshop should assess the potential for more standardization of reporting methods.

3. Define staff categories or criteria to be included in denominator as “exposed staff”. For hospital staff who are not considered employee (e.g. contract workers to provide services such as phlebotomy), for temporary agency workers, medical residents, private hospital physicians), it may be difficult to calculate the number of full-time equivalent. Using number of occupied beds in denominator instead of number of exposed staff would bypass the challenge of identifying exposed staff. Hospitals beds can be divided into intensive care/surgical/medical/obstetric-gynecologic beds to acknowledge for different degree of exposure to risk of percutaneous injury.

*(available for download on http://www.med.virginia.edu/medcntr/centers/epinet/epinet3.html).*
Staff orientation: Work-related injuries
Occupational percutaneous exposure (PCE) and mucocutaneous exposures (MCE) to blood or potentially infective biological fluids

6 GAO projection of CDC NaSH data
**Staff orientation: Excessive hours worked**

1. **Definition**

*Excessive weekly working time:*

Version A1: proportion of week worked over 48 hours
Version A2: proportion of week worked over 60 hours
Version A3: proportion of week worked over 150% regular working time according to national legislation

a. **Numerator:** for each week, number of full-time staff (nurses and nurse assistant) who worked more than 48 (or 60 or 150% of regulation), summed up on all the weeks in the period under study

b. **Denominator:** total number of weeks during observation * number of full-time employees

c. **Inclusion criteria:** Limit to nurses and nurse assistants/aids. Include only hospital employee (exclude working hours contracted through temporary work agency)

d. **Data collection:** Undertake a retrospective study of the percent of weeks worked more than 48 hours during the period from January to March 2004. If hospitals have to collect the information manually, they might choose a shorter time period for collection.

2. **Rationale – Justification for use**

a. **Burden:**

*Negative impact:*
- Long hours cause fatigue\(^1\), reduces productivity and increase the risk that nurses will make mistakes that harm patients\(^2\).

*Positive impact:*
- Long shifts improve continuity of care and hence can have a positive impact on safety
- Overtime is sometimes required to meet demand and assure accessibility of care in context of serious nursing shortage: the alternative being the closure of some beds
- Long working hours are sometimes welcomed from the employees as a important source of additional revenue (especially in Eastern European countries)

b. **Importance – Prevalence – Potential for improvement:**

Long working hours are highly prevalent in CIS countries. For instance, in Latvia and Ukraine, doctors and nurses work on average 60 hours a week\(^3\). In Western countries, mandatory overtime is a highly controversial subject. It is exacerbated by current nursing shortage.

c. **Hospital impact:**
- Limited by alternatives to overtime available to compensate lack of staff (e.g. and the degree of autonomy and flexibility in hiring new staff, constrained by centralization of power and nursing shortage

d. **Validity:**

\[
\begin{align*}
(1) & \text{ Impacts on staff health and staff satisfaction (dim: SO}^{\text{i}} \text{)} \\
(2) & \text{Reflects overload and job strain (dim: Saf/SO}^{\text{ii}} \text{)} \\
(3) & \text{Impacts on patient safety (more controversial) (Saf/CE}^{\text{iii}} \text{)} \\
(4) & \text{In a context of nursing shortage, reflects acquisition of resources (Dim:RG}^{\text{iv}} \text{)} \\
(5) & \text{Reflects Human resources planning (dim: SO}^{\text{v}} \text{)} \\
\end{align*}
\]

\(^1\) Dimension: Staff orientation
\(^2\) Dimension: Safety perspective on staff orientation
\(^3\) Dimension: Patient safety, safety perspective on clinical effectiveness
\(^4\) Dimension: Responsive governance
\(^5\) Dimension: Staff orientation
Staff orientation: Excessive hours

Face validity:

1. Conceptually, extensive working hours significantly reduces time for sleep and social activities that result in fatigue and limited social life, both negatively impacting on health and especially on psychological well-being. Fatigue results in slowed reaction time, lapses of attention to critical details, errors of omission, compromised problem solving, reduced motivation. Impact of extensive working hours is moderated by various factors such as extent of night work, time between shifts, workload, stress, employee’s social and community life, family responsibilities, sleep propensity.

2. In most circumstances, overtime is a response to inadequate staffing. However, in the Commonwealth of Independent States (CIS) countries, it is suggested that overtime is a structural part of professional arrangement supported by culture or justified by an economic incentive to increase salary (e.g., physician overtime hours “watching in the hospital”).

3. A panel of 18 experts from The Institute of Medicine called for a ban on extended hours because they put the staff and patient safety at risk.

4. Reflects human resource planning only in contexts where nursing staff is insufficient and there are alternatives to overtime to compensate for missing staff.

No consensus on use: This indicator is currently not used in the performance assessment systems under study.

Construct validity:

1. Staff health and staff satisfaction

   Staff health: the main results of a recent and extensive review of the literature in the general population (not specific to health care workers) is that evidence suggests long hours are related to fatigue; equivocal relationship between long hours and stress or mental ill-health (mediating effect of control over job); strong evidence that people perceive that working long hours leads to poor work-life balance. Another review of the literature supports that long working hours is associated with psychological ill health and sickness absence.

   More specifically, for nurses, in one study, working more than 12 hours a day or more than 40 hours a week and off hours (weekends and other than day shift) was associated with a 50-170% increase in the age-adjusted odds ratio for musculoskeletal disorders of the three body sites under study (neck, shoulders and back). For physicians (UK consultants medical microbiologists), working more than 48 hours was significantly associated with increased psychological morbidity.

   Staff satisfaction: For Australian anaesthetists poor recognition and long hours were the major dissatisfying aspects of the job. We did not find any study on nurses. We did not find any specific study for nursing staff.

2. Patient and staff safety:

   The United Kingdom government attempted to oppose the European Directive on Working Time, arguing that there is no convincing evidence that hours of work should be limited on health and safety grounds.

Strengths: strong face validity and some construct validity

Limits: difficult to identify cut-off between what can be considered excessive and acceptable working hours, not applicable to all staff categories, only partly under hospital influence, limited validity as indicator for staff and patient safety (still controversial)
3. To add meaning – Guide for interpretation

**Screening tool**

| X |

**Conclusive assessment**

a. **Direction and targets:** lower rate is preferred

b. **Stratification – alternative measures:**

   **Stratification:**
   - Professional category
   - Department (intensive care / emergency / operating room / obstetrics / internal medicine / surgery)

   **Alternative (complementary) indicators:**
   - Results of a survey on perceived workload and satisfaction with working hours and working conditions\(^{vi}\)

   For further scrutiny and for internal use, we recommend hospitals to monitor monthly and, for the indicator on extended hours, compute average by day of the week or night/day shift.

   **Background measure:** staffing ratios. It is extremely important as low staffing ratio may partly justify overtime but also indicate higher workload and job strain and hence larger impact of excessive working hours of staff fatigue and health.

c. **Related performance indicators:**

   - Result of a survey on satisfaction at work, morale and perceived workload and job content (Tailored – Staff orientation)
     - *Expected relationship:*
   - Vacancy rate (Tailored – Staff orientation)
     - *Expected relationship: a high vacancy rate increases the need for overtime*
   - Percutaneous injuries (Core – Safety perspective on Staff orientation) and other occupational injuries (see complementary indicators)
     - *Expected relationship: Fatigue increases the risk of injuries*
   - Absenteeism (Core – Staff orientation)
     - *Expected relationship: Short-term absenteeism is very disrupting for organization of care and allows little time to adjust schedules and take steps to replace absent worker present staff may need to compensate for absent staff. Long-term absenteeism could also be related to excessive hours because it was shown to be associated with stress, fatigue and lower mental health.*

d. **Exogenous variables:**

   - **Staff factors**
     - The impact of long working hours on staff fatigue depends on factors such as age, sex, coping strategy, general health status and external factors such as distance from work or number of dependants.
   - **Hospital factors** (degree of hospital influence depends on the context):
     - Staffing levels (depends on budget, vacancy rates, national or local norms)
   - **Country or regional factors**
     - National legislation regarding regular working hours, maximum working hours and payment of overtime
     - Supply of medical and nursing staff in comparison to demand: nursing shortage
     - Availability and price of alternative resources such as temporary/agency work

\(^{vi}\) For illustration, items from a survey in Eastern Europe countries by the International Labour Office: I am very concerned by the amount of overtime I work, I am happy with my current hours, I wish I could work more flexibly, By the standards of my country, my working conditions are excellent “Health care in Central and Eastern Europe: Reform, Privatization and Employment in Four countries”. International Labor Office, Geneva, Switzerland, 2001. 51 p. Available from [http://www.ilo.org/ses](http://www.ilo.org/ses)
Staff orientation: Excessive hours

- Degree of flexibility for hospitals to recruit staff and adapt to variations in demand for care (e.g. seasonal, epidemics)
- Professional and cultural expectations

e. Quality improvement strategies:
Open question to identify strategies that mediate the impact of long hours on satisfaction, health and safety:
- Promote healthful work-rest patterns
- Increase choice and control over work hour and rest breaks.

4 Dawson D, McCulloch K, Baker A. Extended working hours in Australia: counting the costs. 2001; Department of Industrial Relations; Australia. 52 p.
Descriptive sheets for PATH core set Responsive governance indicators

We provide only one descriptive sheet for this dimension.

Sheet 1: Breastfeeding at discharge
Responsive governance: Breastfeeding at discharge

1. Definition

a. **Numerator**: Total number of mother included in the denominator breastfeeding at discharge

b. **Denominator**: Total number of delivery fulfilling criteria for inclusion

c. **Inclusion criteria**: Singleton, born at greater or equal to 37 weeks gestation, weight greater than or equal to 2500 grams at birth, 5-minute Apgar score greater than or equal to 5, neither mother nor infant has a medical condition for which breastfeeding is contraindicated (e.g. HIV).

d. **Definitions**: To be determined: exclusive breastfeeding only or include partial breastfeeding?

e. **Data collection**: Breastfeeding may be extracted from the kitchen information system because breastfeeding women receive a different diet. If routine data is not available, hospitals could have a survey on all women discharged during a week or a month, preferably in April-May 2004.

f. **Comment**: Average length of stay strongly differs and it could impact the results. For extremely short length of stay, breastfeeding should have been initiated.

2. Rationale – Justification for use

a. **Positive impact**:
- Breastfeeding is correlated with numerous advantages for babies and mothers including: an improved immune system in infants, reduced asthma, respiratory infections, ear infections, and diarrhea, improved cognitive function, particularly in low birth weight babies, and improved mother-infant attachment.
- Mothers who breastfeed have a reduced risk of premenopausal breast cancer, ovarian cancer and osteoporosis.

b. **Importance – Prevalence – Potential for improvement**:  
- Breastfeeding is a priority public health area at both national and international levels. For instance, a **WHO recommendation**\(^1\) indicates that “Breastfeeding is an unequalled way of providing ideal food for the healthy growth and development of infants; it is also part of the reproductive process with important implications for the health of mothers. As a global public health recommendation, infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health”.
- Prevalence rates vary widely across countries.

c. **Hospital influence**:
- Hospitals have a real influence on women breastfeeding behaviour:
  - The critical period when mothers, especially those with their first babies, need the most help spans the few days in hospital and the subsequent week\(^2\)
  - Strong evidence supports that hospital processes are related to breastfeeding outcome. For instance, the application of the Ten Steps to Successful Breastfeeding of the Baby-Friendly Hospital Initiative (BFHI)\(^3\) has shown itself to be an effective method of improving breastfeeding practices worldwide. It has shown itself to be an effective method of improving breastfeeding practices world-wide\(^4, 5, 6\)

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\(^1\) International program of The World Health Organization (WHO) and The United Nations Children’s Fund (UNICEF). Based on the WHO/UNICEF Ten Steps to Successful Breastfeeding, the Initiative recognizes hospitals and birth centres that have taken steps to provide an optimal environment for the promotion, protection and support of breastfeeding.

Responsive governance: Breastfeeding at discharge

- Some factors limit hospital’s influence:
  - The cultural component in the decision to start (and continue) breastfeeding limits international comparisons.
  - Feeding decisions seem to be made prior or irrespective of contact with health professionals (study in United Kingdom)\(^7\).

**d. Validity:**

| Reflects health promotion for a specific patient category |

**Strong rationale:** There is a wide agreement
No demonstrated relationship with other health promotion indicator, quality
Breastfeeding at discharge is the only indicator in the PATH core basket of indicator that assesses health promotion. It covers only partially health promotion activities within the hospital and is limited to at a very specific category of patients.

**No demonstrated relationship with other performance indicators:** We did not find evidence support that results on this specific indicator for this specific patient category could be generalized for a global assessment of health promotion at the hospital. We did not find any evidence neither on the relationship with other performance indicators.

**Limited consensus on use:** Breastfeeding is reported at the health system (national or regional) level but it was not included in the hospital performance assessment systems we studied.

| Strengths: very strong rationale, major public health impact |
| Limits: limited hospital influence, covers only partially the area of health promotion in the hospital |

**3. To add meaning – Guide for interpretation**

**Screening tool**

| | | | | X |
| --- | --- | --- | --- |

**Conclusion:**

**a. Direction and targets:** Higher rate is better
- Healthy people 2000 objective\(^8\): increase to at least 75% the proportion of mothers who breastfeed their babies in the early post-partum period (objective 2.11 and 14.9)

**b. Stratification – alternative measures:**
- Alternative definitions to have a more thorough view on breastfeeding:
  - % breastfeeding within 1 hour of birth
    - More directly under hospital’s influence but very restrictive, does not account for all efforts made during mother’s hospital stay to promote breastfeeding
  - % breastfeeding at 24 hours of birth
  - % breastfeeding at one week
    - Requires telephone interview if mother already discharged
    - Removes the bias due to different lengths of stay
  - % exclusive breastfeeding at babies first immunization (2 months)
    - Requires telephone interview
    - Less under hospital’s control
c. Related performance indicators:
- Length of stay for uncomplicated vaginal delivery (Core – efficiency)
  - **Expected relationship**: Differences in length of stay imply differences in follow-up period for this indicator (but not for alternative indicators above). Hospitals with longer lengths of stay may have lower breastfeeding rate if women stop breastfeeding during the very first days after delivery but still during their hospital stay. On the other hand, the first days after delivery are crucial for successful breastfeeding and mothers longer at hospital may be able to receive more support.
- Result of patient surveys, limited to maternity patient (Core – Patient centeredness)
  - **Expected relationship**: A supportive environment for mothers and their babies should have a positive impact on both breastfeeding rate and patient experience/satisfaction.
- Caesarean section rate (Core – Clinical effectiveness)
  - **Rationale**: C-section interferes with the establishment of breastfeeding. A lower breastfeeding rate is observed among women after C-section delivery reflects a higher incidence of underlying maternal morbidity in this group.

d. Exogenous variables:
- **Maternal factors**: working mother, low maternal education level, low income, ethnicity (in some countries)
- **Country or regional factors**:
  - Governmental support, e.g. maternity leave, financial support to poor women who choose to bottle-feed, promotion through media, adoption of WHO code of breastmilk substitutes.
  - Cultural and social environment (e.g. father involvement, re-establish identity as “non mothers”, mother to mother networks).

e. Quality improvement strategies:
For a better understanding of differences in process that could explain difference in breastfeeding outcome, assess degree of compliance with BFHI ten steps to successful breastfeeding
- **Binary variable**: Baby friendly certification (233 facilities in CEE/CIS countries, for detailed number of facilities for each country, visit [http://www.unicef.org/programme/breastfeeding/assets/statusbfhi.pdf](http://www.unicef.org/programme/breastfeeding/assets/statusbfhi.pdf))
- **Self evaluation of the degree of verification of the BFHI ten steps to successful breastfeeding** (breastfeeding promotion index) (see for instance postal questionnaire in Dulon et al. 2003):
  1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
  2. Train all health care staff in skills necessary to implement this policy.
  3. Inform all pregnant women about the benefits and management of breastfeeding.
  4. Help mothers initiate breastfeeding within an hour of birth.
  5. Show mothers how to breastfeed and how to maintain lactation, even if they should be separated from their infants.
  6. Give newborn infants no food or drink other than breast-milk, unless medically indicated.
  7. Practice "rooming in" by allowing mothers and infants to remain together 24 hours a day.
  8. Encourage breastfeeding on demand.
  9. Give no artificial teats, pacifiers, dummies, or soothers to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on
Responsive governance: Breastfeeding at discharge

1 World Health Organization, Fifty-fifth World Health Assembly, Global Strategy for Infant and Young Children Feeding, April 16 2002, A55/15
2 Malik and Cutting, 1998
6 SCOTLAND: Tappin DM. Breastfeeding rates are increasing in Scotland. Health Bull 2001;59:102-107
8 Healthy People 2000 World Health Organization, Fifty-fifth World Health Assembly, Global Strategy for Infant and Young Children Feeding, April 16 2002, A55/15
Descriptive sheets for PATH core set Patient centeredness indicators

Except for “last-minute cancelled surgery” all proposed indicators on patient centeredness rely on patient surveys. In this section, a single descriptive sheet is built for all indicators based on patient surveys. Its format is slightly different. Contrary to other descriptive sheets, no operational definition is provided, as we do not support a specific instrument. We present the surveys we found most often in the literature and decompose them according to the proposed components of patient centeredness. The second descriptive sheet provides definition and evidence to support the indicator “last minute cancelled surgery”.

Sheet 1: Last minute cancelled surgery
Sheet 2: Indicators based on patient surveys
Patient centeredness: Last minute cancelled surgery

1. Definition

Sub-indicator 1: cancelled one day surgery on day of surgery

Sub-indicator 2: last minute cancelled surgery for inpatient admission

a. Numerator: Total number of patients who had their surgery cancelled or postponed during the period under study and who meet inclusion criteria

b. Denominator: Total number of patient admitted for surgery during the period under study and who meet inclusion criteria

c. Inclusion criteria:
   - For inpatient, include all elective surgery (use of operating theatre), include both cancellations for clinical and non-clinical reasons, postponed to more than 24 hours. Specifically cover tracer procedures used for other performance indicators (e.g. readmission, mortality).
   - For ambulatory procedures, include both cancellations for clinical and non-clinical reasons, limit to “last minute” cancellations (see NHS definition), limit to tracer procedures used for the indicator on admission after day surgery and rate of one-day surgery.

d. Definition
   A last minute cancellation is a cancellation on the day the patient is due to arrive, after the patient has arrived in hospital, or on the day of scheduled operation. This includes telephone cancellations made on the day of their operation or day of admission. An operation which is re-scheduled to a time within 24 hours of the original scheduled operation is considered as a postponement and not a cancellation.

e. Data collection: Undertake prospective survey during one month (for day surgery), preferably during April-May 2004 (to avoid holidays)

2. Rationale – Justification for use

a. Burden:
   - From a patient centeredness perspective:
     - Cancellation results in increased anxiety, disappointment and fear of being affected by major health problems, especially in patients undergoing major surgery, such as heart operations, and already strongly affected emotionally. Many patients feel sudden postponement or cancellation to be a strongly negative experience.
     - Unnecessary hospital stay or increased length of stay is observed when surgery is cancelled or postponed.
   - From a clinical effectiveness perspective:
     - For some interventions, prolonged waiting time increases the risk of complications.
   - From a financial perspective:
     - Unused sessions due to last minute cancellations are very costly for the hospital and restricts access.
     - Prolonged hospital stays have a financial impact on patients, hospitals, and the health system.
     - Unpaid missed day of work and travel to the hospital to undergo ambulatory surgery are also costly for the patient and/or persons accompanying him.
     - New preoperative assessment or additional exams are required if operation is strongly delayed or if change in condition of the patient can be expected.
     - Positive aspect: over-booking of the operating room increases risk of cancellations on day of surgery but decreases risk of unused sessions and improves access.
b. Importance – Prevalence – Potential for improvement:
- **Inpatients**: 8.5% (Sweden, one hospital, heart operations), 10% (Northern Ireland, one hospital, total joint replacement), 17% (US, one acute care hospital, all type of surgeries included), 31% (United Kingdom, one hospital, maxillofacial surgery)
- **Ambulatory patients (one day surgery)**: 0.61% for administrative or organizational reasons and 0.58% for medical reasons, and 0.81% for the patient not attending (Australia, cancellation after arrival at the facility), 10% (Canada, pediatric day surgery)
- Illustration of the potential for improvement: In a Spanish hospital, three years after implementing quality improvement actions (e.g. prior telephone call, surgical schedule centralization), cancellations were reduced from 12.38% to 3.35%. This result is supported by another observational study for ambulatory patients, in an English hospital, the rate of cancellation decreased from 8-12% in the years prior to the intervention to 2.25% after implementation of a program pre-operative questionnaire and telephone screening.

c. Hospital impact:
- Observational study: Out of the 39 Australian hospitals taking part to the National Demonstration Hospital Program (NDHP), 11 reduced cancellation on the day of surgery by 20% or more.
- Most cancellations are occurring because of administrative problems and are hence thought to be avoidable. Common reasons for cancellations are lack of medical clearance and outpatient not attending surgery. In most instances, those cancellations could have been prevented. In one study, 10% of all day pediatric patients surgeries were cancelled on day of surgery, and half of those cancellations were considered to be preventable.
- Potential strategies: (1) Improved patient evaluation or pre-admission assessment, liaison with general practitioners, communication between physician and patient, and patient education, (2) planning, schedule design and waiting list system, (3) Support via follow-up telephone calls or internet based systems.
- Hospital impact is limited when resources are too tight and hospitals have no autonomy to acquire additional resources (equipment, beds, staff).
- Cancellations caused by intercurrent disease are considered inevitable.

d. Validity:

<table>
<thead>
<tr>
<th>(1) Impacts on patient experience (dim: PC)</th>
<th>(2) Is influenced by and impacts on use of operating room (dim: Eff)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3) Is influenced by and impacts on waiting time (access) (dim: RG)</td>
<td>(4) Cancellation for organizational factor, reflects smooth process of care (Dim: Eff)</td>
</tr>
<tr>
<td>(5) Cancellation for patient factor, reflects patient education and preparation (Dim: PC/RG)</td>
<td></td>
</tr>
</tbody>
</table>

**Face validity:**
Very high consensus on use in performance assessment systems under study: this indicator is currently used by ACHS, Maryland Quality Indicator Project, NHS, ORYX.

**Construct validity:**
- Several observational studies report a decrease in cancellations following implementation of preoperative assessment clinics (see above).
- In one study, stepwise logistic regression indicated that patients attending both the surgeon’s office and the hospital perioperative clinic were less likely to have their surgery cancelled for reasons deemed preventable.
Patient centeredness: Last minute cancelled surgery

**Strengths:** high consensus on use, high burden, large potential for improvement

**Limits:** burden of data collection, hospital impact limited by exogenous variables

3. **To add meaning – Guide for interpretation**

<table>
<thead>
<tr>
<th>Screening tool</th>
<th>X</th>
<th>Conclusive assessment</th>
</tr>
</thead>
</table>

a. **Direction and targets:** lower rate is preferred

b. **Stratification – alternative measures:**

**Stratification:**
- Patient related reasons (patient initiated): patient does not keep the appointment or suddenly refuses the operation.
- Medical reasons (physician initiated): the patient’s health deteriorates or the preoperative investigations are not complete.
- Organizational reasons (hospital initiated): no operating theatre available, no intensive care beds available, no equipment available, because of previous operations exceeding expected schedule or arrival of emergency patients, staffing shortage, administrative reasons (e.g. no insurance, no signed informed consent form, lost file).

**Alternative indicator:** For cancellations for hospital-initiated reasons, median time after cancellation until surgery is done. This measure is not relevant for patient-initiated reasons (if he does not show up, it is likely that he renounced to the intervention and will not show up anymore) or clinical reasons (delay is conditioned by evolution of patient health status and not under hospital’s control).

**For further scrutiny and for internal use,** we recommend hospitals to monitor specific reasons for cancellation by department.

c. **Related performance indicators:**
- Operating room unused session (Core – Efficiency) and occupancy rate (Tailored – Efficiency)
  - **Expected relationships** is mixed.
  - Cancelled surgery may result in a wasted operating room session. In most instances, surgeries resulting in wasted operating room sessions are caused by patient medical, social or administrative factors.
  - **Over-booking** (to compensate for no show or last minute cancellation for medical reasons) of the operating room and very tight schedules may increase the risk of a procedure being cancelled because of unavailability of resources. In this instance, more cancellations or postponements for organizational factors are expected.
- Proportion of patients admitted on day of surgery (sub-indicator of “length of stay” – Core – Efficiency)
  - **Expected relationship is mixed:**
  - **Selection bias:** If operating room needs to be rescheduled and procedures are postponed just a couple of days before scheduled surgery, affected patients will not have been admitted yet if admission is on day of surgery but may be already admitted if it was planned earlier
  - **Less flexibility:** When patients are admitted on the day of surgery and condition changed, it might be difficult to adjust for surgery and it may result in cancellation.
  - **Confounding factor effect:** Both indicators are related with quality and organization of pre-operative care.
**Patient centeredness: Last minute cancelled surgery**

- Results of patient satisfaction/experience survey, especially on continuity of care, multidisciplinary teamwork (comprehensiveness), and patient education (Core – Patient centeredness)
  - **Expected relationship**: less cancelled surgeries associated with higher score on patient survey
- Median and variance of time on waiting list, for identical tracer procedure (Core – Responsive governance)
  - **Rationale**: all three measures are related with management of waiting list. Cancellation of procedures is disturbing the waiting list management and could result in a higher variance. A long time on waiting list increases the chance of evolution of disease or occurrence of concurrent conditions and also cancellation of procedure for clinical reason. Moreover, cancellation of procedures increases the time on waiting list for the patient.
- Admission after day surgery
  - **Expected relationship**: Positive.
  
  Admission after day surgery and cancellation of one-day procedure for clinical reasons are both expected to be associated with inappropriate patient selection for day procedure and, to a lesser extent, with inappropriate scheduling of procedures (e.g. too late).

**d. Exogenous variables:**

- **Patient factors**
  - Cancellation for clinical reasons: evolution of disease and concurrent conditions
  - Patient initiated cancellations:
- **Hospital factors** (degree of hospital influence depends on the context):
  - Urban / rural area
  - Clinical practice among anaesthetists as to which patients are cancelled for clinical reasons
  - Type of surgery
  - Proportion of emergency surgery
  - Availability of resources to match needs
  - Bed occupancy rate (especially for intensive care beds)
- **Country or regional factors**
  - Availability of resources to match needs
  - Flexibility regarding to hire staff and
  - Pressure on operating room due to long waiting times

**e. Quality improvement strategies:**

Open question to identify strategies to decrease:

- Describe organization (timing, content, nurse/surgeon/anaesthetist) of pre-operative assessment
- Describe educational material handed out to patient to prepare for the intervention
- Describe process for informed consent (on admission, on day of surgery or before scheduling surgery)

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Patient centeredness: Last minute cancelled surgery

Patient centeredness: Indicators based on patient surveys

Rationale for use:
- patient is the ultimate arbiter of patient centeredness
- patient perception impacts on compliance (and ultimately outcomes), loyalty and recommendations to friends
- feedback on patient perception is useful to align patients’ expectations and hospital’s mission
- it can guide quality improvement efforts to better answer patients’ expectations
- it allows to monitor impact of quality improvement initiatives
- it is a tool to increase accountability towards patient and community

Reliability & validity:
- strong rationale for use
- widely accepted – consensus on use
  - In our survey among participating countries: all 11 respondents (10 countries) answered “yes, certainly” to the question “would you consider measuring patient satisfaction/perception to evaluate yourself if you were proposed a standardised questionnaire”
  - Patient surveys are compulsory in the UK, France, and Belgium (Flemish region)
- standardized questionnaires have widely been tested for internal consistency and reliability
- responsive/proved useful

Burden of data collection is limited (data already collected in some countries/hospitals). However, for hospitals not yet using patient surveys, burden of instrument development is relatively high. This is probably one of the main reasons why many hospitals do not measure patient satisfaction/perception though they say they would be interested to do so. The WHO project would have an important role to play in supporting this step by suggesting a limited number of standardized questionnaires, and by providing a database of potential items.

Instruments:
- Many standardized patient survey questionnaires – thoroughly tested for reliability and validity- are available.
- Those instruments can be organized around three different approaches:
  - Factual measures – Patient experience with care received (e.g. Picker Institute) – Scoring – Frequency of occurrence of an event (typically answers: “often” to “never”)
  - Affective measures – Patient satisfaction or patient judgement (Parckside / Press Ganey, Patient Judgement on Hospital Quality) – Rating – Degree of satisfaction (typical answers: “very poor” to “excellent”)
  - Gap between explicit expectations and realities of the service receive (e.g. Servqual)
- Each approach has its own strengths and weaknesses
  - Rating: What really matters from the patient point of view is compliance with his expectations. Based on the assumption that objectivity is unrealistic, proponents of this approach support that it is better to fully recognize and accept subjectivity factor. Differences in rating can reflect differences in underlying process or differences in patient expectations. A limit of this approach is that patients are reluctant to criticize which is a potentially serious threat to discrimination and hence validity.
  - Scoring: problem-oriented approach more sensitive to differences in quality; scorings are not built on patients’ expectations and hence less sensitive to case-mix and cultural variations (as long as valid in the context), points more directly on specific events calling for improvement and hence more actionable upon, BUT not value-free, contextual-validity and generalization can be a concern; perverse incentives (to easily actionable upon - focus on specific aspects in questionnaire to increase score but not overall quality)
- Different approach can be used for different dimensions within the same questionnaire
Strategies to add meaning to patient survey results – for a further understanding

- Survey of initiatives implemented during this year in order to increase patient centeredness
- Complement with measures of the degree to which hospitals listen to their patients:
  - standardized instrument (Yes/No)
  - sample size - proportion of patient asked about their opinion
  - categories of patients concerned (specific questionnaires for ambulatory/paediatric/psychiatric/… patients?)
  - participation rate (%)
  - with whom information is shared (board, senior management, managers at department level, nurses at program of department level, physicians, other hospital staff, quality committee, community at large)
  - where relevant: translation of the survey available to accommodate people not speaking the official language
  - formal structure to record patient complaints (e.g. ombudsman):

Conclusion and recommendations

1. For hospitals NOT conducting patient surveys yet or using home-made tools, PATH proposes a limited list of standardized instruments, well agreed on, and provide written documentation to support in the choice
2. For countries, where it is still very uncommon to conduct patient surveys, work at the national level to limit the number of instrument in circulation
3. For hospitals already conducting patient surveys using recognized standardized instruments, provide a bank of items to complement (and not replace!) the current instruments to make sure all the sub-dimensions in the framework are covered (and specific indicators can be computed for each sub-dimension)
4. Indicator inclusion in the final report: follow a flexible an empirically rooted strategy and adjust the report to the instruments (“customized” report)
   a. If the hospital is not using a standardized instrument:
      • Include in the hospital report only variations in hospital’s score (how much did he improve or depreciate over the last year? or the last three years?)
      • Match the instrument’s sub-dimensions to the framework and provide specific ratings (index scores) for each sub-dimension
   b. If the hospital is using a standardized questionnaire:
      • Similar to alternative a. (rating comparative to hospital itself in the past)
      • Moreover, provide ratings comparative to hospitals using the same instrument (name the “peer group”, specify the number of hospitals on which it was compared, and provide in the appendix further information if useful)
## Patient centeredness: Indicators based on patient surveys

### Table a: brief description of major patient survey instruments

<table>
<thead>
<tr>
<th>Picker²</th>
<th>Parkside³</th>
<th>PJHQ⁵</th>
<th>Servqual⁶</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient “objective” experience</td>
<td>Patient satisfaction</td>
<td>Patient satisfaction</td>
<td>1) Patients’ expectations 2) Patients’ experience</td>
</tr>
<tr>
<td>Process of care: occurrence of events, frequency of occurrence, timing of events</td>
<td>Note: Parkside adaptation for Ontario Hospital Report contains a mix of factual and affective indicators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem-oriented approach</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Norm</th>
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</thead>
<tbody>
<tr>
<td>Calls upon patient norms for some items but most are mere reflections of patient experience without any explicit judgment</td>
<td>Implicit patient norms</td>
<td>Implicit patient norms</td>
<td>Explicit patient norms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Picker²</th>
<th>Parkside³</th>
<th>PJHQ⁵</th>
<th>Servqual⁶</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Respect for patients’ preferences and expressed needs</td>
<td>- Unit-based care</td>
<td>- Nursing and daily care</td>
<td>- Tangibles: physical facilities, equipment and appearance of personnel</td>
<td></td>
</tr>
<tr>
<td>- Coordination of care and integration of services</td>
<td>- Physician care</td>
<td>- Medical care</td>
<td>- Reliability: ability to perform the promised service dependently and accurately</td>
<td></td>
</tr>
<tr>
<td>- Information and education</td>
<td>- Support services</td>
<td>- Hospital environment and ancillary staff</td>
<td>- Responsiveness: Knowledge and courtesy of employees and their ability to inspire trust and confidence</td>
<td></td>
</tr>
<tr>
<td>- Physical comfort and pain relief</td>
<td>- Housekeeping</td>
<td>- Information</td>
<td>- Assurance: Caring, individualized attention</td>
<td></td>
</tr>
<tr>
<td>- Emotional support and alleviation of fears and anxieties</td>
<td>- Other caregivers</td>
<td>- Admissions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Involvement of family and friends</td>
<td>- Continuity of care</td>
<td>- Discharge and billing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Transition to home and continuity of care</td>
<td>- Coordination of care</td>
<td>(Remark: empirical factors)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Overall rating</th>
<th>Picker²</th>
<th>Parkside³</th>
<th>PJHQ⁵</th>
<th>Servqual⁶</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Overall, did you feel you were treated with respect and dignity while you were in the hospital?</td>
<td>- Overall quality of care and services received</td>
<td>- How good the hospital did in meeting your expectations for your stay</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>- Overall, how would you rate the care you received?</td>
<td>- There were some things about my hospital stay that could have been better</td>
<td>- The care I received at the hospital was so good that I have bragged about it to family and friends</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Would you recommend this hospital to your family or friends?</td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Case-mix</th>
<th>Picker²</th>
<th>Parkside³</th>
<th>PJHQ⁵</th>
<th>Servqual⁶</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male/female</td>
<td>Sex</td>
<td>Sex</td>
<td>Year of birth</td>
<td></td>
</tr>
<tr>
<td>Date of birth</td>
<td></td>
<td></td>
<td>Last grade or level of school</td>
<td></td>
</tr>
<tr>
<td>Age when left full-time education</td>
<td></td>
<td></td>
<td>Ethnic group</td>
<td></td>
</tr>
<tr>
<td>Ethnic group</td>
<td></td>
<td></td>
<td>Occupation</td>
<td></td>
</tr>
<tr>
<td>Perceived health state</td>
<td></td>
<td></td>
<td>Self-declared income</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current use</th>
<th>Picker²</th>
<th>Parkside³</th>
<th>PJHQ⁵</th>
<th>Servqual⁶</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most widely used survey instrument for PUBLIC REPORTING in North America Instrument for NHS surveys (over 100 surveys in 2001/2) Also in Switzerland, Finland, etc.</td>
<td>More than xx users in US Ontario Hospital Report</td>
<td></td>
<td>Adapted for Spanish Public Hospitals, (SERVQHOS); Used by all hospitals in one Association in Belgium; Comparative study in UK and Finland; Not included in national/Provincial/State reporting systems</td>
<td></td>
</tr>
</tbody>
</table>
### Respect of persons

<table>
<thead>
<tr>
<th>Picker² NHS – core items</th>
<th>Parkside³ adapted for Ontario</th>
<th>Press Ganey⁴ (rating from very poor to very good)</th>
<th>PJHQ⁵ (rating from excellent to poor)</th>
<th>Servqual⁶ Note : « assessment » part</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relief of emotional needs – concerns – anxieties – empathy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Did you feel the nursing staff was concerned about you as a person?</td>
<td>- Did you find someone on the hospital staff to talk about your concerns?</td>
<td>- Physician’s concern for your questions and worries</td>
<td>- Helpfulness and concern of admitting staff: their courtesy and concern for your comfort and feelings</td>
<td>- When you have a problem, the hospital shows a sincere interest in solving it</td>
</tr>
<tr>
<td>- Did you feel comfortable about sharing your personal concerns with the nursing staff?</td>
<td>- If you had any anxieties or fears about your condition or treatment, did a doctor discuss them with you?</td>
<td>- Degree to which hospital staff addressed your emotional/spiritual needs</td>
<td>- Respect for you: How well the doctor listened to what you had to say, how well the doctor understood what you thought was important</td>
<td>- The hospital gives you individual attention</td>
</tr>
<tr>
<td>- Ditto for nurses</td>
<td>- Ditto for nurses</td>
<td>- Concerns about your comfort during tests or treatments</td>
<td>- Attention of nurses to your condition: How often nurses checked on you and how well they kept track of how you were doing</td>
<td>- The personnel of the hospital understand you specific needs</td>
</tr>
<tr>
<td>- Do you think the hospital staff did everything they could to help control your pain?</td>
<td>- Where you given enough privacy when discussing about your condition or treatment?</td>
<td>- Amount of attention paid to your special or personal needs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Were you given enough privacy when being examined or treated?</td>
<td>- Nurses’ attitude towards your requests</td>
<td>- Ditto for doctors</td>
<td></td>
</tr>
</tbody>
</table>

| Respect & privacy | | | | |

| - Did doctors talk in front of you as if you weren’t there? | - Staff concerns about your privacy | - Privacy: Provisions for your privacy | | |
| - Did nurses talk in front of you as if you weren’t there? | | | | |
| - Where you given enough privacy when discussing about your condition or treatment? | | | | |
| - Were you given enough privacy when being examined or treated? | | | | |
### Patient centeredness: Indicators based on patient surveys

<table>
<thead>
<tr>
<th>Courtesy</th>
<th></th>
</tr>
</thead>
</table>
| - How would you rate the courtesy of  
  * the nursing staff?  
  * your physicians?  
  * the people who delivered food?  
  * the receptionist/secretary?  
  * the social workers?  
  * the volunteers?  
  * the housekeeping staff? | - Friendliness, courtesy of  
  * the nurses  
  * physician  
  - Courtesy of  
  * the person who admitted you  
  * the person who cleaned your room  
  * the person who served your food  
  * the person who started the IV | - Courtesy and friendliness of nurses  
  - Concern and caring by nurses: Courtesy and respect you were given, friendliness and kindness  
  - Ditto for doctors  
  - Attention of admitting staff to your individual needs: their flexibility in handling your personal needs and wants  
  - Ditto for doctors  
  - Helpfulness: Ability of hospital staff to make you comfortable and reassure you  
  - Housekeeping staff: How well they did their job and how well they acted towards you  
  - Ditto for laboratory workers  
  - Ditto for X-rays staff  
  - Personnel in the hospital is always willing to help you  
  - The behaviour of personnel in the hospital instils confidence in you  
  - Personnel in the hospital are consistently courteous with you |

<table>
<thead>
<tr>
<th>Others</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- If your family or someone else close to you wanted to talk to a doctor, did they have enough opportunity to do so?</td>
<td>- Did the nursing staff call you by name?</td>
</tr>
</tbody>
</table>

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103
**Patient centeredness: Indicators based on patient surveys**

**Client orientation**  
**Access to care**

| Picker NHS – core items | Parkside adapted for Ontario | Press Ganey (rating from very poor to very good) | PJHQ (rating from excellent to poor) | Servqual  
<table>
<thead>
<tr>
<th>Access to hospital care</th>
<th></th>
<th></th>
<th></th>
<th>Note: « assessment » part</th>
</tr>
</thead>
<tbody>
<tr>
<td>- (for planned admissions) How do you feel about the length of time you were on the waiting list before your admission to hospital? (as soon as I thought was necessary to should have been admitted a lot sooner)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>- When you were told you would be going into hospital, were you given enough notice of your date of admission?</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>- Was your admission date changed by the hospital?</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Prompt care</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Following arrival at the hospital, how long did you wait before admission to a room or ward or bed?</td>
<td>- When you used your call button, were you answered promptly</td>
<td>- Promptness in responding to the call button</td>
<td>- Nursing staff response to your call: How quick they were to help</td>
<td>- When the hospital promises to do something by a certain time, it does so</td>
</tr>
<tr>
<td>- Did you feel you had to wait a long time to get to your room or ward or bed?</td>
<td>- Were things done in the hospital within a reasonable amount of time?</td>
<td>- Speed of admission process</td>
<td>- Discharge procedures: Time it took to be discharged from hospital and how efficiently it was handled</td>
<td>- The hospital provides its services at the time it promises to do so</td>
</tr>
<tr>
<td>- When you needed help from staff in eating your meals, did you get it at the time you needed it?</td>
<td>-</td>
<td>- Waiting time for test or treatments</td>
<td>- Personnel in the hospital give you prompt service</td>
<td>-</td>
</tr>
</tbody>
</table>

104
## Patient centeredness: Indicators based on patient surveys

- **Comprehensiveness**

<table>
<thead>
<tr>
<th>Picker²</th>
<th>Parkside³</th>
<th>Press Ganey⁴</th>
<th>PJHQ⁵</th>
<th>Servqual⁶</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS – core items</td>
<td>adapted for Ontario</td>
<td>(rating from very poor to very good)</td>
<td>(rating from excellent to poor)</td>
<td>Note: « assessment » part</td>
</tr>
</tbody>
</table>

- **Continuity and coordination of care**
  - **Within the organization**
    - How organized was the care you received in Accident and Emergency?
      - How organized was the admission process?
    - Sometimes in a hospital, a member of staff will say one thing and another will say something different. Did this happen to you?
      - Did you feel there was adequate communication among all your caregivers concerning your care?
    - Was there one doctor in overall charge of your care?
      - During your hospital stay, did doctors, nurses or other hospital staff ask your name and address more often than you thought should have been necessary?
      - If you stayed in more than one nursing unit, was the transfer between units handled well?
    - Were your scheduled tests or x-rays performed on time?
      - How well staff worked together to take care of you
      - Coordination of care: The teamwork of all the staff who took care of you
      - Teamwork among doctors who cared for you
      - Overall efficiency of hospital: how smoothly things ran?
### Patient centeredness: Indicators based on patient surveys

#### At the interface with the community – integration of care

<table>
<thead>
<tr>
<th>Picker²</th>
<th>Parkside³ adapted for Ontario</th>
<th>Press Ganey⁴ (rating from very poor to very good)</th>
<th>PJHQ⁵ (rating from excellent to poor)</th>
<th>Servqual⁶ Note: « assessment » part</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Was your discharge delayed for any reason?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>- Did hospital staff discuss with you whether you would need any health or social care services after leaving hospital? (e.g. district nurse, care assistant, physiotherapist or social worker)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>- Was your discharge from the hospital handled smoothly?</td>
<td></td>
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<tr>
<td>- If follow-up care was needed, was it provided?</td>
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<tr>
<td>- Were you sent home from the hospital before you felt ready?</td>
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<tr>
<td>- Extent to which you felt ready to be discharged</td>
<td></td>
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</tr>
<tr>
<td>- Speed of discharge process after you were told you could go home</td>
<td></td>
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<td></td>
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<tr>
<td>- Help with arrangements of care (if needed)</td>
<td></td>
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</tr>
<tr>
<td>- Coordination of care at your discharge: Hospital staff’s efforts to provide you with your needs after you left the hospital</td>
<td></td>
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</tr>
</tbody>
</table>

#### Patient information and empowerment (involvement into care)

<table>
<thead>
<tr>
<th>Picker²</th>
<th>Parkside³ adapted for Ontario</th>
<th>Press Ganey⁴ (rating from very poor to very good)</th>
<th>PJHQ⁵ (rating from excellent to poor)</th>
<th>Servqual⁶ Note: « assessment » part</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- While you were in the A&amp;E (or the medical admission unit), did you get enough information about your medical condition and treatment?</td>
<td></td>
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</tr>
<tr>
<td>- When you had important questions to ask a doctor, did you get answers that you could understand?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- When you had important questions to ask a nurse, did you get answers that you could understand?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Did you receive satisfactory answers from the nursing staff?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>- Did your physicians adequately explain your diagnosis and treatment to you?</td>
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<tr>
<td>- Did your physician keep you informed about your condition and the care planned for you?</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>- Were your questions about your tests/treatments answered in a way you could understand?</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>- Where you satisfied with how well you family members were kept informed about your condition?</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>- Where you told what to expect during your stay?</td>
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</tr>
<tr>
<td>- If you were place on a special/restricted diet, how well was it explained?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Explanations about what would happen during tests or treatments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Information given to your family about your condition and treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- How well physician kept you informed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Information you were given: How clear and complete were the explanations about tests, treatments and what to expect</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Informing family and friends: How well they were kept informed about your condition and needs?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Ease of getting information: Willingness of hospital staff to answer your questions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Information given by nurses: How well nurses communicated with patients, families and doctors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Amount of information you were given about your illness or treatment</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>- The personnel in the hospital tell you exactly when the services will be performed</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

#### Activation – Education (patient is made responsible for his health)

<table>
<thead>
<tr>
<th>Picker²</th>
<th>Parkside³ adapted for Ontario</th>
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<th>Servqual⁶ Note: « assessment » part</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Did a member of staff explain the purpose of the medicines you were to take home in a way you could understand?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Did a member of staff tell you</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>- Before you were discharged, did the hospital staff prepare you or your caregiver to manage your care at home?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- When you left hospital, did you</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Instructions given about how to care for yourself at home</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- How clear and complete the information was about how to prepare for your stay in the hospital and what to expect once you got there</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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106
### Patient centeredness: Indicators based on patient surveys

<table>
<thead>
<tr>
<th>Decision-making</th>
<th>Patient centeredness: Indicators based on patient surveys</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Did you want to be more involved in decisions made about your care and treatment?</td>
<td>- Instructions: How well doctors, nurses and other staff explained how to prepare for tests and operations</td>
</tr>
<tr>
<td>- Staff efforts to include you in decisions about your treatment</td>
<td>- Discharge instructions: How clearly and completely were you told what to do and what to expect when you left the hospital</td>
</tr>
<tr>
<td>- Did someone explain your extended life support (living will) options?</td>
<td>- Recognitions of your opinions: asking what you think is important and giving you choices</td>
</tr>
<tr>
<td>- Did someone give your information about organ donation?</td>
<td>- Involving family and friends in your care: How much they were allowed to help in your care?</td>
</tr>
<tr>
<td>- Did someone give you information about the patient’s bill of rights?</td>
<td>- Consideration of your needs: willingness to be flexible in meeting your needs</td>
</tr>
</tbody>
</table>

#### Clean, pleasant, comfortable environment

<table>
<thead>
<tr>
<th>Picker</th>
<th>Parkside adapted for Ontario</th>
<th>Press Ganey (rating from very poor to very good)</th>
<th>PJHQ (rating from excellent to poor)</th>
<th>Servqual Note: « assessment » part</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean</td>
<td>In your opinion, how clean was the hospital room or ward you were in?</td>
<td>- Staff efforts to include you in decisions about your treatment</td>
<td>- Room cleanliness</td>
<td>Personnel in the hospital are neat in appearance</td>
</tr>
<tr>
<td>- How clean were the toilets and bathrooms that you used in hospital?</td>
<td>- Staff efforts to include you in decisions about your treatment</td>
<td>- Room cleanliness</td>
<td>- Room cleanliness</td>
<td>- Room cleanliness</td>
</tr>
</tbody>
</table>

Note: This table outlines various aspects of patient centeredness and cleanliness in hospitals, including patient surveys and assessments.
## Patient centeredness: Indicators based on patient surveys

<table>
<thead>
<tr>
<th><strong>Pleasant, comfortable</strong></th>
<th><strong>Food</strong></th>
<th><strong>Others</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Were you ever bothered by noise at night?</td>
<td>- How would you rate the hospital food?</td>
<td>- Safety and security: The provisions for your safety and the security of your belongings</td>
</tr>
<tr>
<td>- (when waiting before admission) For most of the time, were you waiting</td>
<td>- How much food were you given?</td>
<td></td>
</tr>
<tr>
<td>in a cubicle, an open plan area, a corridor, somewhere else, can’t remember</td>
<td>- What is your overall opinion of the food served during your stay?</td>
<td></td>
</tr>
<tr>
<td>on a bed, a trolley, a chair, something else, can’t remember</td>
<td>- Temperature of the food (col foods cold, hot foods hot)</td>
<td></td>
</tr>
<tr>
<td>- For most of your stay, what type of room or ward were you in?</td>
<td>- Quality of the food</td>
<td></td>
</tr>
<tr>
<td>- Did you ever share a room or ward with patients of the opposite sex?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Did the nursing staff place things needed within you reach?</td>
<td>- Condition of your room: cleanliness, comfort, lighting, and temperature</td>
<td></td>
</tr>
<tr>
<td>- Noise level in and around room</td>
<td>- Supplies and furnishings: Completeness of supplies, condition of the furniture, how well things worked</td>
<td></td>
</tr>
<tr>
<td>- Pleasantness of room décor</td>
<td>- Restful atmosphere: Amount of piece and quiet</td>
<td></td>
</tr>
<tr>
<td>- Room temperature</td>
<td>- Hospital environment: Other than your room, how comfortable, quiet, pleasant it was</td>
<td></td>
</tr>
<tr>
<td>- How well things worked (TV, call button, lights, bed, etc.)</td>
<td>- Signs and directions: ease of finding your way around</td>
<td></td>
</tr>
<tr>
<td>- Accomodation and comfort for visitors</td>
<td>- Hospital building: How would you rate the hospital building overall</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Parking: Number of spaces available</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Provisions for family and friends: Adequacy of visiting hours and facilities for them; visitors treated like welcomed guest</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- The physical facilities are visually appealing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- The hospital has modern looking equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Materials associated with the service (such as pamphlet or statements) are visually appealing</td>
<td></td>
</tr>
</tbody>
</table>
Patient centeredness: Indicators based on patient surveys

Clinical effectiveness from patient’s point of view

<table>
<thead>
<tr>
<th>Picker NHS – core items</th>
<th>Parkside adapted for Ontario</th>
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<th>Servqual Note: « assessment » part</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Overall, are you satisfied with the outcome of your hospital stay?</td>
<td>- How well your pain was controlled</td>
<td>- The outcome of your stay; How much were you helped by the hospitalization</td>
<td>- The hospital gets the things right the first time</td>
<td></td>
</tr>
<tr>
<td>- Do you feel the condition for which you were admitted</td>
<td></td>
<td>- Medical facilities: how complete and up-to-date the medical equipment was?</td>
<td>- personnel in the hospital have the knowledge to answer your questions</td>
<td></td>
</tr>
</tbody>
</table>
| - How would you rate the skills of  
  ▪ the nursing staff?  
  ▪ physicians?  
  ▪ the people who drew blood  
  ▪ physiotherapists | - Skill of  
  ▪ the nurses  
  ▪ physician  
  ▪ the person who took the blood  
  ▪ the person who started the IV (e.g. did it quickly, with minimal pain, etc.) | - Skills and competence of nurses: How well were things done, like giving medicines and handling IVs | - Competence and skill of nurses | |
| | | - Competence and skill of nurses | - Skill of doctor: Ability to diagnose problems, thoroughness of examinations, skill in treating your condition, and scientific knowledge | |
| | | | | |
Patient centeredness: Indicators based on patient surveys


2 http://www.pickereurope.org/
   Core items and items databank available at http://www.nhssurveys.org/


4 http://www.pressganey.com/

5 Rubin HR, Ware JE, Nelson EC, Metereko M. The Patient Judgements of hospital quality (PJHQ) questionnaire. Medical Care 1990;28(9):S17-S18

### Table 1: Dimensions which are associated (either reflective or formative) with the indicator

<table>
<thead>
<tr>
<th>Dimension – Sub-dimension</th>
<th>Core</th>
<th>Reflective of</th>
<th>Formative of</th>
<th>Relates to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical effectiveness and patient safety</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appropriateness of care</td>
<td>C-section rate</td>
<td>CE/appropriateness of care</td>
<td>CE/safety/outcomes/complications</td>
<td>Neonatal mortality</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CE/safety/process/risk avoidance</td>
<td></td>
<td>Complications: uterine rupture,…</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CE/safety/process/aggressiveness of care</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Negative histology after appendectomy</td>
<td>CE/appropriateness of care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conformity of processes of care</td>
<td>Prophylactic antibiotic use</td>
<td>CE/safety/process/risk avoidance</td>
<td>CE/safety/outcomes</td>
<td>Wound infections</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CE/appropriateness of care</td>
<td>Eff/productivity</td>
<td>Cost of antibiotics/patient</td>
</tr>
<tr>
<td>Safety processes</td>
<td>Staff excessive hours worked</td>
<td>Staff/behavioural response/attractiveness</td>
<td>CE/safety/process/aggressiveness of care</td>
<td>PCE injuries</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Staff/behavioural response/absenteeism</td>
<td>CE/safety/outcomes/complications</td>
<td>Short-term absenteeism</td>
</tr>
<tr>
<td>Outcomes of care and safety processes</td>
<td>Mortality rates for selected tracers</td>
<td>CE/outcomes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Readmission rates for selected tracers</td>
<td>CE/outcomes</td>
<td>Eff/appropriateness services</td>
<td>Length of stay</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RG/syst. integration/follow-up</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PC/client orient/information/education</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>PC/client orient/comprehensiveness</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eff/productivity/LOS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Admission after day surgery</td>
<td>CE/outcomes</td>
<td>PC/subjective experience</td>
<td>Rate of day surgery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CE/safety/outcomes/complications</td>
<td></td>
<td>Rate of cancelled procedures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eff/appropriateness services</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Return to ICU for selected tracers</td>
<td>CE/outcomes</td>
<td>PC/subjective experience</td>
<td>Return to operating theatre</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CE/safety/process/risk avoidance?</td>
<td>Eff/productivity/cost</td>
<td>Occupation rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CE/safety/process/aggressiveness of care?</td>
<td></td>
<td>Length of stay in ICU</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RG/PHO/access</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sentinel events</td>
<td>CE/safety/outcomes/complications</td>
<td>Eff/productivity/LOS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appropriateness of services</td>
<td>Ambulatory surgery rate (extension: medical acute care)</td>
<td>Eff/appropriateness of services</td>
<td>Eff/productivity/cost</td>
<td>Cancellation of procedures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CE/process/innovativeness</td>
<td>PC/subjective experience</td>
<td>Waiting time</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Admission after day surgery</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>OR utilization rate</td>
</tr>
<tr>
<td>Productivity</td>
<td>Length of stay for selected tracers</td>
<td>PC&amp;C/CE/internal coordination of care</td>
<td>Eff/productivity</td>
<td>Discharge preparation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CE/outcomes/ improved health</td>
<td></td>
<td>Waiting time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CE/safety/outcomes/complications</td>
<td>PC/client orient/empowerment</td>
<td>Readmissions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CE/process/clinical pathways</td>
<td></td>
<td>One-day surgery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RG/syst. integration/discharge preparation</td>
<td></td>
<td>Descriptive: transfer rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PC/client orient/empowerment/</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Admission on day of surgery</td>
<td>PC&amp;C/CE/internal coordination of care</td>
<td>Eff/productivity</td>
<td>Length of stay</td>
</tr>
<tr>
<td>Dimension – Sub-dimension</td>
<td>Core</td>
<td>Reflective of</td>
<td>Formative of</td>
<td>Relates to</td>
</tr>
<tr>
<td>---------------------------</td>
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<td>--------------</td>
<td>--------------</td>
<td>------------</td>
</tr>
<tr>
<td>Efficiency (con’t)</td>
<td></td>
<td></td>
<td>Eff/productivity</td>
<td></td>
</tr>
<tr>
<td>Max use of capacity</td>
<td></td>
<td>Smooth production flow</td>
<td>Eff/max use capacity</td>
<td>Cancellation of procedures</td>
</tr>
<tr>
<td>Financial performance</td>
<td></td>
<td></td>
<td>Eff/financial perf/financial processes</td>
<td>Waiting time</td>
</tr>
</tbody>
</table>

Staff orientation and staff safety

| Economic factors |      |              |                      |           |
| Practice environment |      |              |                      |           |
| Perspective and recognition of individual needs | Training days | Staff/org. factors/recognition of needs | Staff/outcome | Staff ratios |
| Health promotion and safety initiatives | Budget dedicated to staff HP activities | Staff/org. factors/health promotion | Staff/outcomes/objective health |
| Staff experience |      |              |                      |           |
| Behavioural responses | Short-term absenteeism | Staff/behavioural responses | Staff/productivity/cost |
| Work-related injuries (PCE) | Staff/behavioural responses | Staff/behavioural responses | Staff/behavioural response |

Responsive governance and environmental safety

| System integration and continuity | Perceived continuity through patient surveys | RG/syst. integration/continuity | PC/subjective experience | Length of stay |
| Discharge letters to GP | RG/syst. integration/integration | RG/syst. integration/continuity | PC/subjective experience |
| PHO: access | Wating time for selected tracers (median & variance) | RG/efficiency | RG/PHO/access |
| PHO: Health promotion | % women breastfeeding at discharge | RG/PHO/health promotion | CE/outcomes |

112
<table>
<thead>
<tr>
<th>Dimension – Sub-dimension</th>
<th>Core</th>
<th>Reflective of</th>
<th>Formative of</th>
<th>Relates to</th>
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<tbody>
<tr>
<td><strong>Responsive governance and environmental safety (con’t)</strong></td>
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<tr>
<td>Equity and ethics</td>
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<td>Environmental concerns</td>
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<tr>
<td><strong>Patient centeredness</strong></td>
<td>Overall perception/satisfaction</td>
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<tr>
<td></td>
<td>Cancelled procedures for admin. reasons</td>
<td>PC/access</td>
<td>PC/subjective experience</td>
<td>Length of stay</td>
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<td></td>
<td><strong>Bed occupancy rate</strong></td>
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<td>OR utilization rate</td>
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<td>Rate of one day surgery</td>
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<td>Cancelled procedures for clinical reasons</td>
<td>RG/integration</td>
<td>PC/max use resources</td>
<td>Staffing ratios</td>
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<tr>
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<td></td>
<td>PC/CO/empowerment/education</td>
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<tr>
<td>Interpersonal aspects</td>
<td>Survey result</td>
<td>PC/interpersonal</td>
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<tr>
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<td>Staff/behavioural responses</td>
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<tr>
<td>Client orientation: access</td>
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<td>Client orientation: amenities</td>
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<tr>
<td>Client orientation: comprehensiveness</td>
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<td>PC/CO/comprehensiveness</td>
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<td>Client orientation: information and empowerment</td>
<td>Survey result</td>
<td>PC/CO/empowerment</td>
<td>CE/outcomes/readmissions</td>
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<td>Eff/productivity/LOS</td>
<td>CE/safety/outcomes/complications</td>
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<td>Eff/productivity/LOS</td>
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<td>Client orientation: continuity</td>
<td>Survey result</td>
<td>PC/CO/continuity</td>
<td>CE/safety/outcomes/complications</td>
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<td>RG/integration/continuity</td>
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<td>Length of stay</td>
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</table>
Table 2: Example of the dashboard of the PATH project

Country: 11
Hospital: 11
Data collect: Année 2003 et janvier 2004 pour prendre en compte les réhospitalisations en lien avec une hospitalisation en décembre 2003

CORE Indicator: Readmission within 30 days; Risk-adjustment: age and sex
Stratification / tracer: Acute Myocardial Infarction (AMI)

Global rate: 9.11 %
CI: 2.32 %
N: 593

<table>
<thead>
<tr>
<th>Stratify by sex and age</th>
<th>n</th>
<th>N</th>
<th>%</th>
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<tr>
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<tr>
<td>age 15-24</td>
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<tr>
<td>age 45-64</td>
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<td>126</td>
<td>12.70</td>
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Reflective of
- CE/outcomes
- RG/syst. integration/follow-up
- PC/client orient./information/education
- PC/client orient/comprehensiveness
- EF/productivity/LOS

Formative of
- EF/appropriateness services

Relates to
- Length of stay

Global rate: 9.11 %
CI: 2.32 %
N: 593

<table>
<thead>
<tr>
<th>Year</th>
<th>Hosp 11</th>
<th>Peer group</th>
<th>Peer group adjust</th>
<th>National average</th>
<th>Nat. average adjust</th>
<th>Objective</th>
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<td>6.4</td>
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