Indicators for all: including occupational health in indicators for a sustainable healthcare system

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Abstract
Many projects have been undertaken to ensure that the Canadian health system is efficient, effective and publicly accountable. One common area for such initiatives is general management of the health system, which includes performance indicators for human resources that involve the use of information technology systems. These indicators have not generally included the occupational health of healthcare workers. Research by the authors – specialists in information science, ergonomics and sociology – involving extensive observations of and consultations with workers in healthcare, suggests that the development and application of indicators for healthcare system performance should include and reflect:

• the full range of work done
• all categories of workers, whatever their status in the hospital hierarchy
• the diversity of patients
• the caring aspect of work
• the preservation of the health and wellbeing of healthcare workers, and of their ability to lead full lives in their families and community
• the ability of workers to learn from and help each other, and the importance of this collaboration as a health-enhancing resource
• the ability of workers to learn from experience, and the importance of this experience as a health-enhancing resource
• the long-term consequences of current practices for public health and public finances.

Key words
Hospital, indicators, occupational safety and health, performance indicators, sustainability, women

Introduction
A number of projects have been carried out to make sure that the Canadian health system is effective, efficient and publicly accountable. Most of these projects include indicators that are used to assess the performance of the system's human resources, indicators which involve the use of information technology systems. Information technology systems are also being developed in order to improve the assessment of the health of Canadians, which requires the development and monitoring of indicators of health status and determinants of health.

Along with funds invested in health information technology systems, much public attention has focused on the potential of information technology to collect, transmit and analyse information on the performance of the health system and the health of Canadians. Calls are heard for the development of standardised health indicators to be inscribed into information
Amid enthusiasm about the potential of information technology to address health system problems, important issues about the information that such systems will transmit have been neglected. It is increasingly important to consider why health indicators are developed, and the processes through which health and health system performance indicators are generated.

During a research project on the introduction of information systems into Canadian health settings, we found that our observations of and interviews with health workers yielded valuable insights into healthcare work that are not reflected in indicators currently used to monitor health system performance. Yet, as Wistow & Hardy put it:

... it cannot be stressed enough that the quality of care is inextricably linked to the quality of employment. (p. 183)

Our research has also shown us first hand the consequences of making decisions and allocating resources in healthcare based on indicators that do not adequately reflect the realities and complexities of healthcare work. Drawing on our varied experiences studying health sector workers, we will illustrate the importance of the knowledge and experience of health sector workers for developing health indicators. We will also illustrate limitations that are inherent to existing health system performance and health indicators, and argue that health indicators must capture a broader range of parameters.

Our contribution draws on our experiences studying health sector workers from varied perspectives, with a focus on:

- workers' interactions with health information technology (author 1)
- how workers organise their jobs ergonomically (author 2)
- how health sector reform influences patient care (author 3).

Our work – undertaken in three different Canadian provinces (British Columbia, Ontario and Québec) - is concerned with the improvement of women's work in both formal (e.g. hospital) and informal (e.g. home) settings. By looking at similar situations from varied perspectives and in various contexts, we have been able to identify numerous limitations inherent to existing indicators that would likely remain hidden in a single discipline-based investigation of health sector workers and work.

The importance of indicators

Indicators measure something that cannot directly be measured. They are:

... variables linked to the variable (studied), which itself cannot be directly observed. (p. 47)

Although they should not be taken as true measures of the object for which they were chosen, indicators often assume that role in practice. Given the prominence of indicators as a means through which resources are allocated and performance measured within the health sector, the development and use of indicators in general, and health human resource indicators in particular, warrants attention.

The use of indicators has gained importance in recent years. The recently released Romanow report called for the establishment of common indicators in order to measure the performance
of the healthcare system, the establishment of benchmarks and the collection of information to be used to:\(^5\)

... report publicly on efforts to improve quality, access and outcomes in the health care system. (p. 52)

The establishment of common indicators to measure the performance of the health system has been identified as a priority in order to stabilise and improve the health system.\(^5\)

The Canadian Institute for Health Information collects data from Canadian provinces and territories, so that it can report to Canadians about both health system performance (eg surgical waiting lists) and the incidence of health conditions (eg diabetes) across Canada. Such national data collection activities are essential to the development of common indicators and national benchmarks that can be used to measure and track the performance of the health system, so as to ensure that public accountability (specifically related to universal availability of services) is maintained.\(^5\)

Reporting on key health indicators is also seen as essential to the development of performance targets in health, and the measurement of progress towards achievement of those targets. Health indicators fill an important role in the creation of a health system that is both efficiently run and effective. As Romanow\(^5\) pointed out, health indicators are also used to determine the equity of healthcare services.

Spending on healthcare does appear to make a difference in health outcomes. Health indicators such as life expectancy and infant mortality clearly show that problems are diminished when spending increases.\(^6\) But the effect is neither immediate nor direct. An inefficient system, for example, may use additional health resources to provide higher salaries to healthcare providers without a corresponding improvement in services. Equally, a system with poor accessibility may not assist people who could benefit most from the services. These reasons are often used to explain why a system that spends a great deal of money, such as that in the United States, does not produce the results that would be expected.

In addition to their use nationally, indicators are used at the local level to guide decisions on staffing levels, equipment purchases and system development.\(^7,8\) They can be used both descriptively and prescriptively. Indicators that address accountability can be used descriptively, while indicators that address effectiveness and efficiency can be used prescriptively. They can also be used managerially (eg a cleaning contractor may be required to meet certain cleanliness targets, and the failure to do so may result in contract termination).

Indicators may be used to prescribe staffing ratios and staffing levels in health facilities, to reflect desired norms for hospital length of stay, or to guide the allocation of funds among competing areas within the health sector. Target labour costs and staffing levels are set through the use of prescriptive indicators. Among other things, they allow the comparison of staffing levels of similar facilities.

Indicators may include or reflect various dimensions. For example, indicators used to determine healthcare staffing include the typical health status of patients on a given ward and the number of beds, while those used to assign cleaning staff involve the floor surface texture, numbers and dimensions of rooms, and patient turnover. These indicators have been developed through complex processes, sometimes including time and motion studies, usually complemented by
comments from supervisory staff, and input from consultants (such as Deloitte Touche Tohmatsu) who set staffing level benchmarks based on national comparisons.*

Other groups have suggested the use of different types of indicators, such as patient satisfaction. The use of indicators to determine healthcare management practices in Canada is mediated through collective agreements, budgetary allocations, staff availability, managerial philosophies and some political processes. Workers have rarely been involved in the development of indicators or in their application in management practice. We argue that observing work and interviewing workers, as we have often done over many years, provide important information that should be used in developing and applying indicators to such practices as setting staffing levels, scheduling, budgetary allocations, equipment purchasing and outsourcing.

Our various research projects, involving extensive observations of and consultations with workers in healthcare, lead us to the conclusion that the development and application of indicators, at least at the local level, should include or reflect the following:

- the full range of work done, including some aspects that often remain invisible (usually because the work is done mainly by women and appears as the extension of a domestic role)
- all categories of workers, whatever their status in the hospital hierarchy
- the diversity of patients
- the specific context and requirements of healthcare, particularly the caring aspect
- the preservation of the health and wellbeing of healthcare workers, and of their ability to lead full lives in their families and community (often ignored because they are women and the work they do appears 'natural')
- the ability of workers to learn from and help each other, and the importance of this collaboration as a health-enhancing resource
- the ability of workers to learn from experience and the importance of this experience as a health-enhancing resource
- the long-term consequences of current practices for public health and public finances.

Parameters that should be included

The full range of work

The first of these may seem obvious, yet much of the work involved in care disappears from view when the focus is on tasks and easily quantifiable actions. Some of the work remains invisible because it is mainly women who do the work and it is assumed that the task done by the professional is the same as that done by other women at home. Bathing a patient, for example, can be seen as a simple act of applying water to skin, a task that can easily be done by virtually anyone. Yet Armstrong’s Ontario research indicates that while the nursing aide is doing this, she is undressing the patient, examining her skin, listening to her complaints.

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*Although national consultants are frequently used to set benchmarks for staffing levels in hospitals, many management staff are critical of their reports. In one case, data from such a report suggested that savings could be achieved that exceeded the budget of the evaluated unit. In other cases, members of middle management have been critical of such reports because although the consultants’ reports leave managers with information about appropriate levels of staffing, they do not provide any indication of how to achieve recommended levels, which may be difficult for managers to implement because of constraints built into collective agreements, organisational culture and so on.
as well as remembering how the patient likes the water, the order in which she likes to be undressed and where she hurts. At the same time as she uses the bath for information gathering, the aide is using all her communication skills to encourage co-operation and provide comfort. All this takes time and work, which may not be captured in an analysis of the job.

Balka's findings during fieldwork in an intensive care unit* echo this observation. While giving a patient a bed bath, a nurse determined that her patient's wound had opened, and internal organs had migrated out of her abdominal cavity. The patient required immediate emergency surgery, which the nurse began organising as soon as she observed the problem during the bed bath. Job analysis undertaken in the interests of achieving efficiencies (eg by transferring the task of bathing to a less skilled and hence less costly worker) is likely to reflect a view of bathing as an activity whose goal is cleanliness, rather than cleanliness plus patient assessment and care. Structuring work on the basis of indicators that reflect this narrower view of bathing can leave patients at risk.

The full complexity of a job may only be easily visible to those who do it. Seemingly idle chatter among intensive care nurses provides a context for sharing knowledge about unusual procedures, and scheduling staff breaks to accommodate patient needs. Sharman12 found that bed reservation clerks must co-ordinate their allocation of beds with an intricate network of cleaners, emergency room admissions, relatives, available transportation and homecare, to mention only part of the network. Cleaners do tasks that are not, strictly speaking, part of cleaning, eg they pick up dropped objects, carry out translations for patients and comfort them. Often they are the only people in a patient's room who can do this work.11,13,14 They become very involved in patient care and express regret and bitterness over the limited views that others have of their role. For example, cleaners in long-term care facilities became attached to patients, and complained that they were forgotten and excluded from rites of passage when a patient died. Without a better picture of the work that is done, indicators cannot provide the basis for accurate monitoring and evaluation of resource needs.

Staffing ratios for cleaners are derived, as previously noted, from representations of the spaces to be cleaned and their difficulty. However, when workers are not consulted, difficulties can arise. In one case, the introduction of a computerised staffing procedure for cleaners led to replacing one 'light work' (ie women's) job by one 'heavy work' (ie men's) job. Women then complained of severe overwork. Observation and interviews showed us that a number of 'invisible' operations done by women had been left out of the computer input, eg:

- the dusting of certain equipment in rooms
- moving objects in order to dust tables underneath
- additional operations that were needed when cleaning mirrored surfaces
- difficulties arising from the purchase of furniture with textured, black surfaces.

In addition, the increasing and praiseworthy tendency to humanise hospital wards by allowing patients to bring pictures and objects from home had a heavy impact on the dusting done by women workers, but was not taken into account in the computer program used to schedule cleaning staff.9

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9 This work was undertaken with Servane Mason, Research Coordinator, Centre for Clinical Epidemiology and Evaluation,
Other invisible job components have been described as ‘articulation work’ and ‘work-arounds’. Articulation work is non-routine work that makes it possible for a technology to be used effectively in a given setting - linking the technology with the real work situation. In contrast, work-arounds allow users to complete a set of tasks, despite the inadequacies of a technology, by ‘working around’ them. Workers may have to make up for inadequacies in the system in order to do their jobs. For example, admissions clerks in a Québec hospital had to print out computerised forms for patient admissions then ‘white out’ part of them before filling them out on a typewriter, because the forms did not allow them to fit the required information into the boxes available. Similarly, admissions clerks in a Vancouver hospital had to enter several foreign names and addresses in a general notes field rather than the name and address fields, because the computer system did not accommodate the variety of address formats or the long names of some of Vancouver’s diverse population.

Armstrong’s interviews with cleaners show that workers cannot complete their work to required standards in the time available. Yet the record sheets must show that the work has been done, prompting cleaners to call them ‘lie sheets’. Discussions with frontline staff about recording data that are incorporated into indicators for management suggest that many staff are aware of the politics of indicators, and, in efforts to protect their jobs or programmes, engage in such ‘data gaming’ activities. If indicators are to reflect effectiveness they need to include the vital information that workers are forced to leave out. Decisions are now being made on such issues as the privatisation of ‘ancillary’ hospital services, without accurate information on productivity or efficiency of cleaning. How can this be obtained without giving attention to basic assumptions underlying work organisation in hospitals? In other words, developing indicators is not just a technical job, but one that requires intense attention to the entire breadth of work experience and relationships.

Sometimes task components are invisible because supervisors have misrepresented or undervalued workers’ experience. Listening to workers’ descriptions of their jobs and their understanding of what needs to be done provides the kind of rich detail and reality-based data that are necessary for the development of indicators. For example, the supervisor of a group of hospital clerical workers heard workers talking among themselves and assumed that they were wasting time chatting. The supervisor ordered walls to separate workers and thus prevent such ‘waste’. Subsequent observation of the workers revealed that they did spend 20 per cent of their time communicating with each other. However, they were not chatting idly but exchanging information vital to the completion of the admission process. The walls could not be erected without disrupting this vital communications system and construction was halted. Similarly, Balka’s research in a British Columbia hospital revealed that clerical workers’ complaints about new keyboard drawers reflected actual physical faults in the equipment and not, as supervisors and training staff had assumed, the women’s lack of skills in operating them.

All categories of workers
Our research indicates that those employed in hospitals define themselves as working in care whether they perform a surgery or clean up after it. In fact, people provide care whether they are paid a salary to provide it in a hospital or paid nothing at all to provide it at home. The literature on the determinants of health supports this wide definition of caring. The consultation processes used to generate indicators need to incorporate the full range of care providers and types of care.

Sometimes it is important to expand the definition of relevant consultations to consider unanticipated groups. For example, cleaners are rarely considered as part of the healthcare
team. As participants in a union session told us: ‘We’re the assholes’; ‘We’re at the bottom’; ‘We’re a group apart’; ‘We’re the hospital trash’. Because of this, they are rarely consulted when hospital furniture and fixtures are being chosen, although their work is directly affected. When it was decided that black, irregularly textured furniture and mirrored walls would enhance the look of the hospital offices and boardroom, cleaners spent much more time dusting and cleaning, but experienced much less satisfaction with the quality of their work. ‘They’ll never see God in their whole lives for getting that black stuff,’ muttered one woman while dusting a black, rough, dust-catching table.

In British Columbia, when it was decided that the running of a hospital pharmacy would be facilitated by introducing an automatic drug dispenser, nurses were not involved in the decision-making process. Inadequate training resulted in frequent line-ups, as nurses struggled to get the automated drug dispensing machines to unlock so they could access patient medications. To obtain patient medications, nurses had to select the names of the drugs they needed from a master list of drugs kept in the machines. The logic of how drugs were named within the computerised system was idiosyncratic (eg oral vitamins were called vitamins, and intravenous vitamins were listed as multi-vitamins), and resulted in time-consuming searches for the correct names of medications, which were required to access the system. Not all drugs were dispensed through the automated machines, and nurses had a difficult time determining which drugs would be dispensed through the automated machines and which would remain available through the older medication carts. Had nursing staff been more extensively consulted prior to the introduction of the automated drug dispensing system, these problems could have been avoided.

Diversity of patients
Differences among patients influence the amount of work and how it is done. Thus, work represented by indicators as uniform may in fact be quite variable. The work involved in admitting patients, for example, depends on the characteristics of the patient – ability to function, language skills, support system.

In a Québec study of admissions, most of the patients were old and ill, many had impaired hearing or cognitive problems, many were fearful, and a large proportion were immigrants with a limited command of French. In one case, an admissions clerk phoned a patient to ask her to come in for an operation three days later (such calls are often made many months after the patient has been advised that they need an operation). The clerk’s task required finesse and patience, as can be seen from the observation notes:

Asks for the patient; gives the date and time the patient is to come to the hospital; asks whether the patient will remember; asks her to get a paper and pencil; asks whether there is anyone else to call to whom she can give the information; repeats the request to get paper and pencil; asks whether she can write; asks whether she understands; asks whether she can repeat the information; corrects the information saying that she isn’t to come at 3am but on the 3rd of October; asks for the phone number of the patient’s son; asks her to repeat the date of hospitalisation; corrects her, saying, ‘It’s not Friday, it’s Tuesday’; the patient hangs up abruptly.

*Here we find a possible link to the issue of failing to understand work as a process that encompasses multiple groups within an organisation, as opposed to a series of activities introduced to aid primarily one group of workers.
Other studies reveal similar findings. For example, an intensive care nurse wishing to set up a family conference may have to organise it around the availability of a translator, while a bed reservation clerk, who has to reconcile the requirements of many different services, can have her careful plans disrupted by a patient whose family comes late to pick him up. Equally, cleaners can have their carefully timed work plan thrown off too, eg by someone vomiting on a desk.

Indicators that reflect ideal staff-to-patient ratios are typically based on assumptions of average patients (eg who do not require translation, are not vomiting and so on) and average days (eg when patients do not require emergency surgery). A failure to recognise the diversity within patient populations and over workdays during the development of indicators can thus lead to staffing shortages that compromise patient care and workers’ health.

The specificity of healthcare
This recognition of variations in work activity is related to the specific context and requirements of healthcare. Healthcare is about human life, and its risks and consequences cannot be assessed exclusively or even primarily using indicators based on the economic functioning of service provision. Such limited economic indicators provide information only about the cost of services, and often neglect the impact or outcome of service provision on patient and staff health (which have long-term effects on cost). Both levels of economic impact should be considered in any evaluation of the state-funded Canadian health system.

Healthcare work involves mediation between healthcare institutions and individuals, all of whom have their own specific complex of health issues and health history shaped by particular cultural, social and economic contexts. Although it is clearly important to search for patterns in population health and for evidence about the efficacy of interventions in order to generate guidelines for planning and treatment, it is equally important to understand that such patterns may not apply very well in a given situation. Perhaps this is why there is widespread physician resistance to the use of prescribed, ‘evidence-based’, unique clinical pathways in medical practice, despite the aura of scientific orthodoxy surrounding the expression ‘evidence-based’.

What is thought of as evidence in healthcare may be what works relatively well for a significant proportion of people most of the time, among those elements of care that can be described with numbers. Healthcare needs and the methods of addressing them can never be precisely scientifically established, so the notion of being able to determine accurately the ‘one best way’ to treat a patient is inappropriate. A skilled practitioner will in fact adapt the proposed treatment to a specific individual’s situation.

Moreover, care is an interactive process, with both the care provider and the care recipient engaged with each other in ways that necessarily have an impact on what will be done, and on its effects. For example, knowing that a patient who is to be discharged after heart surgery lives alone on the fourth floor of a building that has no elevator should have an impact on the number of days the patient remains hospitalised. A failure to account for the specificity of the patient’s home life could affect the outcome of the patient’s recovery from surgery. Providers must acquire knowledge of whole people and their contexts, and of the complex and different ways people respond to care. This requires a range of complementary skills that may be supplied by healthcare workers. The co-ordination of these skills to produce health means that care providers need to collaborate and consult, and also that they must have the autonomy required to make judgments about the needs of the person requiring care. Autonomy in turn requires that providers take responsibility and are trusted to take responsible action.
Health and wellbeing of healthcare workers

The rising rates of absenteeism among healthcare workers are of increasing concern and have been linked to problems with work organisation. As noted earlier, healthcare workers are almost unanimous in expressing distress at the loss of meaning and satisfaction in their work, which results in more absences. Because of absences and dissatisfaction, hospital human resources personnel spend an increasing amount of time managing the health of healthcare workers.

There have been some attempts to tie patient health outcomes to staffing levels, eg by looking at staffing levels in relation to hospital-acquired infection rates. The magnet hospital literature attempts to address the relationship between staff satisfaction with work environment and patient health outcomes. The development of these innovative approaches to indicators may signal an emerging awareness of the need to develop indicators that are sensitive to the health and wellbeing of healthcare workers. As yet, none of this distress has been used, at least publicly, in the development of indicators for hospital staffing, although research findings – particularly in nursing – suggest a strong relationship between staff work environment and patient health indicators.

Several scholars are engaged in the development of indicators that it is hoped will be sensitive to work environment. However, research undertaken in this area to date has been focused primarily on nursing staff and fails to address other groups of workers. In fact, some energy has been devoted to making the indicators used to determine workers’ compensation reflect less accurately the state of illness among workers, by diminishing the numbers of compensated claims and recourses through temporary assignments of injured workers. A recent request for proposals issued by Health Canada to develop workplace guidelines for healthcare workers suggest that no such guidelines exist to date.

Beyond the state of health or illness of healthcare workers, a larger view would emphasise that workers are human. This means that they have variable health status, physical condition, age, gender, culture, social characteristics, strong and weak points, and differing family and community situations. Workers derive their own strategies to achieve personal and altruistic goals in their working situations. Since we would not want healthcare work done by people who lacked humanity, we must incorporate this humanity in indicators used to manage their job performance. For example, since hospital cleaning staff spend fairly long periods in patients’ rooms, they will often speak to patients and do favours for them, such as bring them water. This practice is forbidden in some hospitals, due to the risk of slowing cleaners’ work and the possibility that cleaners will inadvertently infringe on treatment (as when patients are supposed to have nothing by mouth but ask a cleaner for a glass of water). However, in an environment such as a chronic care hospital, where cleaners are often the only personnel who speak to a patient for any length of time, forbidding cleaners to converse with patients on administrative grounds deprives staff and patients of an important source of pleasure, and may deprive staff of an important source of information about the patients’ condition and concerns.

Under current conditions of shift staffing and job cuts, healthcare workers of all categories are very tired. They therefore need to modulate their tasks in order to preserve energy and avoid having to face a rush. For example, some workers try to concentrate their work early in the day, both to do the tasks when they are feeling fresh and to prepare for the many unforeseen events that can force them into a rush (eg new doctors with changed orders, a health emergency on a ward, a spill). We heard this practice criticised by hospital staff themselves, since it results in exhaustion toward the end of shifts and a higher risk of accidents.
The fact that workers are human also means that they have families and are also responsible for caring at home. In the past, nursing and other healthcare staff, responsible for 24/7 care, have used various strategies to maximise family time and minimise their needs for day care. For example, nurses often chose to be officially registered as part time, filling up their schedules on an on-call basis. This enabled them to have more choice concerning where and when to work. However, cuts in staffing and moves to more ‘flexible’ scheduling had the effect of reducing choices and putting workers, even those with greater seniority, on night and weekend shifts if they wanted to work at all. On-call nurses, who could be called into work up to one hour before a shift, described the considerable family and childcare adjustments they had to make. One nurse had to make packed lunches for her three young children every night and make daycare arrangements for the next day, despite typically being called in only once or twice a month. (This uncertainty was thereby also transferred to her babysitter.)

Collaboration among workers
Workers often help each other and this can be a critical aspect of the work process. Staff often lift patients in teams, in order to protect their backs as well as to ensure a smooth ‘ride’ for fragile patients. In intensive care, staff work together on a range of activities such as bathing patients, responding to emergencies, and setting up and removing equipment. Within and across occupational categories, workers parcel out tasks among themselves according to their strengths, interests and immediate situation. Such phrases as ‘You get his dentures, I’ll change his gown’ are often heard. During 61 hours of observations of hospital orderlies, 1,169 physical operations (e.g. feed patient, push laundry cart and so on) were accompanied by 497 communications to others, mainly personnel, about these operations. On wards where orderlies had worked together for some time, when there was a danger of violence, one orderly would run into a room to help the other, even before the observer in the room had noticed that anything was up.

During 30 hours of observation, clerks whose jobs nominally consisted of making patient appointments and performing data entry in patient records spent 20 per cent of their work time communicating with each other. These communications, viewed by their supervisor as idle chat, were all of a professional nature and concerned ways to reach patients by telephone, how to handle computer glitches and problems, and information about hospital procedures.

Treated respectfully, worker collaboration can be an important resource for employers. For example, when supervisors in one hospital were helped to appreciate the value of collaboration among orderlies in heavy physical tasks, they took this into account in making room assignments. Instead of assigning the two patients in each room to the same orderly, they assigned them to two different orderlies to maximise the time that orderlies could help each other. The orderlies were very pleased with the new arrangement and felt it would ease their physical work load.

However, the possibility of making this kind of arrangement depends on the opportunities available to develop team skills. Workers meeting each other for the first time work much less effectively together than workers who have been able to get to know each other over time. A simple example was told to us by a (male) emergency services worker (ambulancier). When women were introduced into this job, the men noticed a rise in the numbers of times patients on stretchers were dropped and were tempted to think that the women were incompetent. It took a while for the workers to realise that women, who were generally smaller, lifted stretchers in two movements (bed or ground to bent knee, knee to waist height) whereas men usually lifted straight from bed to waist height. Male–female teams had difficulties until workers learned to establish their lifting technique before starting the lift.
Unfortunately, current staffing practices that treat workers as interchangeable units that can be moved freely from ward to ward and treat tasks independent of their caring content\textsuperscript{11,13} interfere with the development of team skills. A recent study of nursing assignments showed that 60 per cent of the 53 different nurses who worked on a single ward during one month had worked a total of five shifts or fewer. On a team level, this translated to a situation where, among 14 nurse-nursing assistant teams assigned to a ward during one week, only two teams of two worked together more than once.

Learning and experience
This high level of mobility can also have an impact on patient health. Nurses who moved from ward to ward speak of not being able to find emergency equipment in a hurry, lack of familiarity with patients, inability to follow patients’ progress, and general information overload from having to remember too many different situations. Other categories of personnel such as cleaners also profit from learning about characteristics of the spaces they clean, if they stay in one place long enough. Over time, they learn that one administrator doesn’t want his desktop touched and another wants it dusted; that it is better to clean one ward later than another due to the timing of medical rounds; that one ward staff wants its wastebaskets here and here, and another wants them there and there; that staff on one ward use the wall needle disposal units but wastebaskets on another may put staff at high risk of needlestick injuries and so on.

It may be wise to develop indicators of staff stability to complement those that have led to a high degree of personnel mobility from ward to ward or such practices as outsourcing that have the same effect. Indicators can be thought of as one way of viewing health sector work. Different types of indicators reflect different views of the work environment. Just as one can establish one’s position in space by using a compass to triangulate in relation to three landmarks, we advocate the use of indicators that represent multiple perspectives of health sector workplaces. One perspective that has been missing from existing indicators is that of the worker.

Long-term planning
Indicators need to consider the long-term consequences of current practices for health and finances. The recent emergency surrounding severe acute respiratory syndrome (SARS) makes it clear not only that all employees are vulnerable and essential, but also that cutbacks in beds and the constant relocation of workers designed to reduce immediate costs can create enormous long-term deficits.

SARS, a form of pneumonia thought to be of viral origin, first attracted attention in March 2003. Identified most clearly with China and Canada, it prompted the World Health Organization to introduce travel advisories and encourage quarantines. As a recent call for research proposals in Canada explains, the:\textsuperscript{58}

\textit{... resulting anxiety in the general population has itself become a major target for outbreak-related public health management, and health leaders in unaffected jurisdictions seek to learn lessons from experiences in affected areas.}

One lesson from SARS is obvious: disease is a global issue, making all populations vulnerable. SARS attracted much media attention, in part because it spread across the world before it was even named and because it seemed to affect those in close contact, regardless of their initial state of health. Healthcare providers were particularly vulnerable, with two relatively young nurses dying from the disease in Canada.\textsuperscript{59} Estimates indicate that almost half of those suffering from SARS worked in healthcare.\textsuperscript{60}
This global vulnerability is linked to a second lesson: the role healthcare restructuring plays in this vulnerability. In Canada, healthcare providers have begun to raise questions about the organisational and managerial reforms that may have contributed to the spread of the disease. The strategy of reducing the number of beds to an absolute minimum, combined with the amalgamation of hospitals and an approach that filled beds regardless of diagnosis, seems to have led to the first transmission resulting in death. The SARS patient who arrived in Toronto was placed next to a patient who should have been in intensive care, but was not because there was a bed shortage. The bed was eventually found in another hospital, transporting the disease along with the patient.\textsuperscript{61,62} Similarly, the strategy of reducing the number of nurses to an absolute minimum, combined with the extensive use of agency nurses who are moved around facilities to fill the growing number of care gaps, seems to have led to the transmission from institution to institution.

In Taiwan, the Center for Disease Control argued that the outsourcing of nursing aides, cleaners and laundry workers contributed to the transmission of SARS in that country. According to the Center’s director:

... nursing aides, who did not have proper disease-prevention outfits, roamed freely in the hospitals and contracted the disease.

Because they were not direct employees, the hospitals could not ‘efficiently manage these workers’\textsuperscript{63} The Taipei Foreign Workers’ Consulting Center reported that, in one hospital, seven foreign nursing aides had contracted SARS, and three of them died.\textsuperscript{63} The suggestion here too is that the managerial strategies that move providers and patients around as a means of cutting costs contributed to the spread of SARS. Moreover, as the Registered Nurses’ Association of Ontario established in their recent research, reforms leave no flexibility in the system to allow this vulnerability to be addressed.\textsuperscript{64}

SARS was a reminder that we currently have no redundancy or safety cushion in our healthcare system, and left us gravely concerned about its capacity to deal with another crisis.

What SARS suggests, then, is the need to consider indicators that help us develop a broader picture and longer-term consequences.

Readmission rates provide another example of the need for longer-term indicators. Current indicators are primarily focused on returns to hospitals after a short period of time (48 hours) for treatment directly related to the initial diagnosis. But deficiencies in care may have effects over the longer term, which are not monitored at present. In many instances, a problem that had its genesis in a hospital setting (through compromised care or inadequate discharge planning) may not appear until more than 48 hours have elapsed. For example, in the scenario described earlier, where a man was discharged after heart surgery to an apartment where he lived alone, up four flights of stairs, his re-admission to the hospital occurred more than 48 hours after his initial discharge. After climbing the four flights of steps to his apartment, the man was so fatigued that he passed out, unable to call the hospital to alert them to his condition. When he failed to return to the hospital for a follow-up test a few days after his discharge, hospital staff, unable to reach him by phone, asked police to drop by his apartment. Police found the man alive, but barely conscious, on his bed close to a phone that his exhaustion prohibited him from reaching. Indicators counted this man’s second visit to the hospital as a new admission, rather than a re-admission, because more than 48 hours had elapsed between the two events.
Conclusions
Indicators are critical to ensuring accountability, efficiency and effectiveness in healthcare. They help us both see what is happening and guide what happens in care. However, the nature of healthcare means that we will never have a complete and single snapshot that provides an accurate picture of what has been and should be done. This is because values are central in measuring or assessing care, because the processes are so dynamic as well as varied, and because some aspects of care can never be captured in quantitative data.

Our research has therefore led us to three major conclusions. First, indicators must incorporate more dimensions of the interfaces between patients, workers and administrations. Current indicators are based primarily on administrative data collected mainly to record inputs and outputs for costing purposes. Information technologies allow more of these data to be collected at the same time as they allow us to use them in order to design and plan care. However, such data have only limited capacity to achieve the triple goals of accountability, efficiency and effectiveness.

Based on our individual involvement in research projects and our collective involvement in research about healthcare technologies, we have suggested ways of expanding the development of indicators. The purpose is to develop a more complex picture of care work that would provide a better basis for planning in healthcare services. More specifically, we have argued that indicators should capture the entire range of work required, including aspects that often remain invisible because they are not easily quantified or because they are associated with traditional women's work. This capturing is most effectively done by seeking out the knowledge of those who actually deliver the services, and is often supported by qualitative research methods.\* The development of indicators also requires the recognition of differences among patients and providers that influence how the work is done and the work that needs to be done. This in turn requires recognising the particular context and requirements of healthcare. And finally, indicators should seek to contribute to our understanding of the long-term consequences for health and for finances in healthcare.

Second, the emphasis on and need for quantifiable data should not do away with an occasional qualitative overview of hospital performance. If, in the opinion of workers, patients or administrators, the numbers do not appear to make sense, it is probable that some important aspect of the hospital situation is not being taken into account. One example is when compensated injury rates of healthcare workers decline, despite a general perception that workers' health is degenerating. The numbers may be wrong, due to retirement or transfer of injured workers, temporary reassignment, or transfer of costs from the workers' compensation system to private insurance.

Third, the best indicators for national and provincial comparisons are not necessarily the most useful at a local level. Hospital administrators should think about those indicators that apply best to their specific situations, taking into account idiosyncratic characteristics such as the demographics of the population served, types of illness, and physical characteristics of the hospitals.

Expanding the development of indicators in this manner may lead to adjustments in current

\*A recent special issue of the journal *Sociology of Health and Illness* (volume 27, issue 6, September 2005) on 'The social organization of healthcare work' contains a number of examples of ways in which qualitative data can be used.
indicators, to the addition of new indicators, or to the replacement of old indicators with new ones. We cannot easily know the outcome until further research is done. In any event, the process should lead to a more complex picture of healthcare delivery and a better basis for directing care services.

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