

From work practice to public policy: New health information technology implementations and their impact on public health data quality

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Objectives

- Outline nature of work practice challenges associated with computerization of the health sector;
- Link work practice issues to data quality issues;
- Highlight data quality challenges related to computing and information infrastructures;
- Outline a framework for examining issues of data quality, from the production of data through use of those data.

Cette présentation a été effectuée le 27 octobre 2006, au cours du Symposium "Nouvelles technologies de l'information en santé publique : implications sur le terrain" dans le cadre des Journées annuelles de santé publique (JASP) 2006. L'ensemble des présentations est disponible sur le site Web des JASP, à l'adresse <http://www.inspq.qc.ca/jasp>.

➤ Overview of talk

Overview of ACTION for Health and work practice studies;

Outline some work practice challenges from ACTION for Health fieldwork;

Link work practices to challenges to production of health data;

Outline a framework for thinking about health data quality.



➤ Overview of ACTION for Health and work practice studies

Social Sciences and Humanities Research Council of Canada study (\$3 million over 4 years);

Many partners including Health Canada, B.C. Ministry of Health, Vancouver Coastal Health Authority, community clinics, etc.

Addresses 3 themes:

- ❑ Issues arising for lay users as they increasingly use the internet to seek health information;
- ❑ Issues arising for health care practitioners as they increasingly use information technology to deliver care;
 - focus on how jobs are changing, organizational challenges, implementation challenges, change management;
 - focus on relationship between information system architecture and indicator availability.
- ❑ Ethical and legal issues related to computerization of the health sector.



Work Practice Studies

Social informatics “examines the design, uses, and consequences of information and communication technologies in ways that take into account their interaction with institutional and organizational contexts” (Kling, 2000, 217).

Related to technology assessment (in contrast to health technology assessment).

Acknowledges that planned work (job descriptions, policies) differ from situated actions (what people actually do).



Indicators, Technology and Work Practices

Indicators can be local, regional, national or international...

Canada has invested billions for development of a Canadian Health Information Infrastructure, which the technological infrastructure will deliver.

Indicators are actors in decision making and resource allocation.

Indicators don't come from nowhere– they come from somewhere (information systems) and they reflect values, as well as affordances and constraints of existing data collection exercises (and the information systems that underpin them).

How are indicators found or made? They increasingly depend on information system.

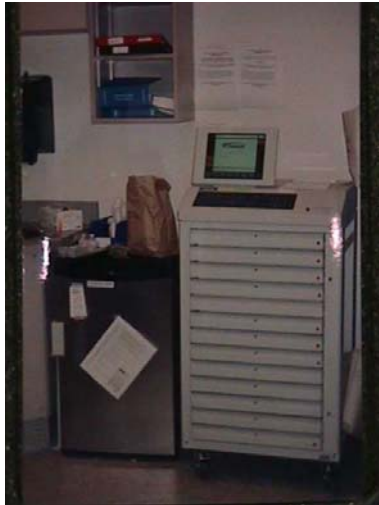
What experiences do staff have using the information systems that are required to generate indicators?

What are the challenges and complexities of data-extraction and re-combination?

Start with some examples from acute care sector about how work practice changes with new technology, then move to examples from public health...



Work Practice Case 1: Drug Dispensing Machines



Password access to patient load; drugs selected from list, drawer (or fridge) is unlocked.

Machine asks staff to perform a count-back procedure to verify drug quantity.

Inventory control is live to pharmacy.

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Work Practice Case 1: Drug Dispensing Machines

Overview

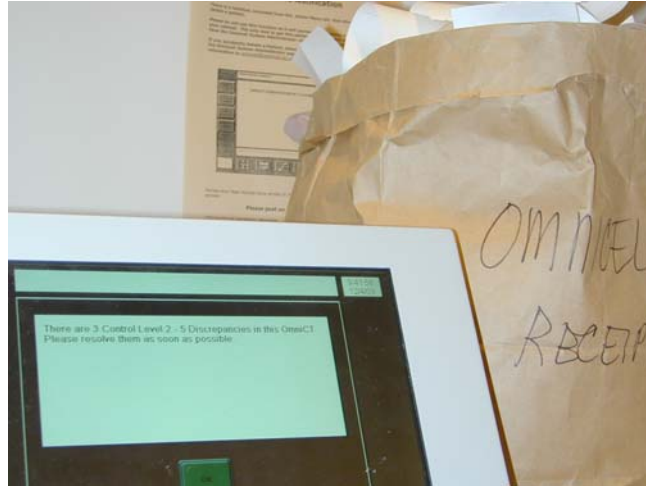
- ❑ Integrated with Pharmacy stocking and inventory system,
- ❑ Includes inventory control,
- ❑ Impacts pharmacy workflow as well as nurses' work.

Issues

- ❑ Frustration with having to waste meds,
- ❑ Confusion over location of meds and how to return meds,
- ❑ Discrepancy reports...

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Work Practice Case 1: Drug Dispensing Machines



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Work Practice Case 1: Drug Dispensing Machines

Work Practices, Data Collection and Data Quality

Work-arounds employed by staff in order to speed up their work flow after implementation of the drug dispensing machines inadvertently contributed to poor data quality.

Work practices dictated by the computerized system such as

- count back of common medications used in high volume,
- selection of item from menu indicating reason for discrepancy

may contribute to poor data quality, and consequently inaccurate indicators.

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Work Practice Case 2: Data Production Challenges and ER Wait Time Data

How are indicators found or made? ER Waiting time data

Local systems (varied, and multiple times recorded)

Abstracted by QUIST (quality utilization information systems)

Hospitals in Canada report emergency room wait times to the provinces and the federal government, who, through the Canadian Institute of Health Information (CIHI) maintains data through 2 databases

The Discharge Abstract Database

The National Ambulatory Care Reporting System.

The Canadian Institute of Health Information (CIHI) addresses methodological and procedural issues related to the collection of data, including emergency room waiting times.

Some data are shared with the Canadian public about ER wait times by CIHI, and other data can be viewed only by reporting institutions that contribute data.

A far messier picture of the data emerge than one might assume based on its widespread use and political significance.

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Work Practice Case 2: Data Production Challenges and ER Wait Time Data

Local ER wait time data collection

In one hospital's emergency room, 6 different times are recorded on the computerized record:

1. a patient's arrival time at emergency,
- 2) the time they are triaged,
- 3) the time they are taken to an emergency department area other than the waiting room (either the treatment area or acute area),
- 4) the time a patient is seen by a doctor (which doctors enter inconsistently),
- 5) and the time a request to admit a patient is made;
- 6) time a patient is admitted.

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Work Practice Case 2: Data Production Challenges and ER Wait Time Data

Local ER wait time data collection

Other hospitals using different information systems (which often play a significant role in determining which data points are collected and which are not) collect times at different intervals in the patient's ER waiting period.

Although other variables such as patient acuity—an important piece of information in determining whether or not care was compromised by a long wait time—are collected, reported data about emergency department wait times typically does not reflect patient acuity.

Considerable variability exists in the underlying logic programmed into triage systems, which can lead to data quality problems.

One electronic triaging system slowed work down for triage nurses so much that use of the system was discontinued after less than 1 year.

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Work Practice Case 2: Data Production Challenges and ER Wait Time Data

How is knowledge about the health care system generated in this process, and which kind of knowledge is it?

Emergency room wait time (Group 4 Field 10) was a new data element introduced in the fiscal year 2001-2002 data set.

Wait time in ER is defined as a “derived data element [which] reflects the difference between the date/time of decision to admit and the date/time the patient left ER, measured in hours”

Five of the thirteen reporting provinces/ territories do not report their ER wait time data in an ICD 9 layout; and a sixth province does not submit their data to the Discharge abstract Database (DAD).

For another 5 provinces, the ER Wait time is an optional data element. In one province, ER wait time is a mandatory field, and in one province the field is not to be used.

Reporting of non-mandatory fields to CIHI is typically low. In those provinces where this was not a mandatory field (all but 1 as of 2003), the response rate was 34% (CIHI, 2003, p. 11).

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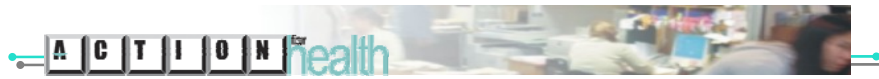
Work Practice Case 2: Data Production Challenges and ER Wait Time Data

How is knowledge about the health care system generated in this process, and which kind of knowledge is it?

The CIHI Data Quality Documentation for the Discharge Abstract Databases (CIHI, 2003) indicates that ER wait time

“may be underestimated for some facilities due to the difficulty in collecting the exact decision to admit time. When the exact decision to admit time is not available, admit time is used as a proxy. [which] may inaccurately reflect wait times for some provinces.”

The data quality documentation also suggests that caution should be exercised when analysing this field over time, as there have been historic changes to wait time data elements, and reporting requirements vary among provinces and territories. In addition to historical variation in wait time data elements, considerable variation exists in how data are collected locally, and how those data are reported by individual hospitals and health regions in Canada.



Work Practice Case 2: Data Production Challenges and ER Wait Time Data

What are the challenges and complexities of data-extraction and re-combination?

“there is no established standard or definition for measuring ER wait times.”^[1] [1] Bingham, J. W. (2004, Oct. 29). Director, Health Reports and Analysis Canadian Institute for Health Information. Personal Communication (by e-mail).

Semantic heterogeneity.....(I'll return to semantic heterogeneity after a brief diversion)...



Work Practice Case 2: Data Production Challenges and ER Wait Time Data

Which organizational, and political issues are at stake in the construction of indicators?

ER wait times invoked in discussions about poor service.

Hospitals with long wait times come under scrutiny.

Publicity about long ER wait times can influence health resource allocation and can lead to new programs.

Standardization of indicators would require standardization of local work practices which is not likely.

Even if feasible, standardization of indicators requires resources and would likely require abandoning costly legacy computer systems.

Different indicators tell different stories and each set of indicators is likely to address different political needs.

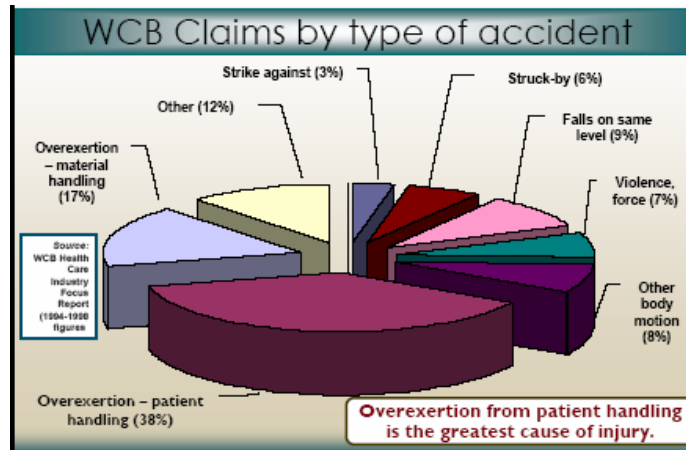
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Case #3: Problems in Use of Data

In preparing a paper for publication we suspected that other researchers had misinterpreted the WCB data base heading.

But..... it turns out that there is no category called "overexertion, patient handling"

That over-exertion, strain is used as a proxy for patient handling over-exertion.... That over-exertion, strain is used as a proxy for patient handling over-exertion....



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Some public health examples: Data merging

Records with slight variation but representing the same person be identifiable as a single patient's record.

Care Connect and Patient Encounter Index: 4 million residents in province- "the most difficult task has been the conversion of over 65 million patient and data records for the old system to the new system."

Reconciliation of duplicate records would require the labour of 20 full time staff members over a 6 month period, at a cost of in excess of \$1 million dollars.

The Chronic Disease Management Toolkit and local electronic records: The problem with data formats.



Framework for thinking about health data quality

