ABSTRACT

The ability to measure population health trends and improvements can be enhanced through collaborative efforts to describe existing knowledge and via shared development opportunities. This paper highlights a project undertaken in Alberta which has created an inventory of health status indicators in use in the province, and provides a framework for strategic progress in the development and use of a common set of indicators across the province. The work may provide a model for other regional health authorities interested in comparing the health of their populations across time and across health regions.

ABRÉGÉ

La capacité de mesurer les tendances et les améliorations de la santé de la population peut être augmentée par des efforts de collaboration pour décrire les connaissances actuelles et par le partage des possibilités de développement. Cet article présenter un projet entrepris en Alberta qui a permis d'inventorier les indicateurs d'état de santé utilisés dans la province, et fournit un cadre pour l'amélioration stratégique dans le développement et l'utilisation d'un ensemble commun d'indicateurs à travers la province. Ce travail peut servir de modèle pour d'autres autorités sanitaires régionales intéressées à comparer la santé de leurs populations dans le temps et entre elles.

Health Indicator Development in Alberta Health Authorities: Searching for Common Ground

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Health Regions need to be able to measure the baseline health of their populations and the impact of the health system on that baseline. Key indicators alert health planners and policy makers to potential issues and enable them to ask further questions which lead to important decisions about the management of health.¹⁻³ A standard set of indicators allows for assessment and monitoring of the overall health of Albertans and also provides comparisons enhancing the usefulness of indicators in policy† development, service planning and evaluation.

Several definitions for health-related indicators exist in the literature.³⁻⁵ The literature stresses that, ideally, indicators should actually measure what they are intended to; they should provide the same answer if measured by different people in similar circumstances; they should be able to measure change; and they should reflect changes only in the situation concerned.^{3,4}

In reality, these criteria are difficult to achieve, and indicators, at best, are indirect or partial measures of a complex situation.

A challenge in developing and defining indicators is linking a concept to an observation that can be collected in an information system⁵ where enormous quantities of data are relatively easy to access. It is vital to give critical thought to how useful the available data are for the purposes of measuring health and monitoring the activities of the health system⁶ and whether the data links conceptually with agreed upon, meaningful indicators.^{1,4,6-8}

The SEARCH‡ Health Indicators project has made an early and important contribution toward the development of health indicators for Alberta. Initial exploration of the level of indicator development and use in Alberta in 1997 suggested the following:

- The historical focus has been on utilization and productivity indicators;
- There is a need to shift focus to indicators related to the overall health of individuals;
- The availability of required data to support indicator use is questionable;
- Consistent and strategic application of existing population health indicators is lacking;
- Indicator development was being conducted independently throughout the province by various key stakeholder groups; and,

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† Health policy may be regarded as the aggregate of principles or themes that prevail in the ways society distributes its resources and power as they relate to population health determinants (Miller C, Fine A, Adams-Taylor S, 1989).

‡ The Swift Efficient Application of Research in Community Health (SEARCH) Program is a collaborative initiative of the Alberta Heritage Foundation for Medical Research, the regional and provincial health authorities and Alberta Health. In partnership with the universities, participants are provided with support and expertise to participate in health research.

- Health reform provides a venue for the systematic identification, development, review and analysis of health indicators in Alberta.

As a result of this analysis, the project team's overall vision is: "The development, implementation and application of a common set of indicators and outcome measures by Alberta health authorities."

This vision will only be accomplished through completion of a number of phases: assessment of the current level of indicator development, collaborative processes to build on what exists, and consistent implementation. The purpose of this initial study was:

- To describe and inventory population health indicators and health system output and outcome indicators being used in the various Health Regions across Alberta as well as within the Mental Health and the Cancer Boards, as of February 1997; and,
- To link and share the inventory with all those involved in health services.

This paper presents results from this first phase of research.

METHOD

A collaborative approach to indicator identification and classification was forwarded through the creation of a targeted survey. Simplicity and user-friendliness were the overriding principles for survey development. The draft tool was reviewed by several key referents and pre-tested in two regions. SEARCH participants in all regions were involved and they, in turn, sought out several local stakeholders in order to complete the indicator survey. This resulted in collective effort and more extensive buy-in at the regional level. The survey tool was used to collect information related to indicator definition, method of calculation, users of the indicator, and the data source.

The project then explored comprehensive frameworks and databases used by others in Alberta, across Canada and in other countries. Table I highlights principles which guided the choice of frameworks reviewed. Models reviewed were then mea-

TABLE I Principles Guiding Indicator Classification	
1. Comprehensive -	<ul style="list-style-type: none"> • encompasses a holistic view of health (physical, mental, spiritual and social well-being and health as resource for everyday life) • accommodates all the indicators submitted by the regions • accommodates all health service outcome indicators as well as health indicators in the same framework
2. Client-centered -	<ul style="list-style-type: none"> • the client, patient, family or community are seen as central • includes subjective as well as objective measures
3. Simple -	<ul style="list-style-type: none"> • facilitates understanding and allows easy retrieval
4. Relational -	<ul style="list-style-type: none"> • describes the relationship of health, health service outcome, public policy and research indicators simply and visually

TABLE II Existing Indicators Used by a Majority of Health Regions in Alberta	
1.	Proportion of Population Living Below the Low Income Cut-off
2.	Proportion of Regular Smokers
3.	Proportion of Women who have had a Pap Test
4.	Proportion of Women who have had a Mammogram
5.	Breastfeeding Rates
6.	Incidence of Low Birth Weight
7.	Number Referred to and from Specific Service or Program
8.	Number of Admissions to Specific Program or Service
9.	Number Served/Number of Visits/Number of Consultations
10.	Average Length of Stay
11.	Number of Separations/Discharges
12.	Wait Lists
13.	Immunization Rates
14.	Hours of Service (Direct and/or Indirect)
15.	Proportion of Persons who do not Perceive Themselves in Good Health/ Subjective Health Ratings
16.	Communicable Disease Rate - Vaccine Preventable
17.	Incidence of Notifiable Diseases
18.	Hospitalization Rate
19.	Mortality by Cause, Age, Gender and Location and Trending
20.	Infant Mortality Rate
21.	Potential Years of Life Lost

sured against these principles.[¶] It was determined that by integrating the Canadian Institute for Health Information (CIHI) indicator framework with the dimensions of quality proposed by the Canadian Council on Health Services Accreditation (CCHSA), the majority of indicators being collected regionally could be utilized. By combining and expanding on these existing frameworks, a new con-

¶ Health and its Biological and Behavioural Determinants Framework. Evans and Stoddard (1990); Dimensions of Health Status & Factors that Affect Them. Bergner (1985); Edmonton Health Information Network (1995); Alberta Health Business Plan Required Measures (1996); The Framework for Planning and Evaluating Community Based Health Services in Canada. Wanke, Saunders, Pong, Church (1995); National Quality Care Organization, HEDIS 3.0, Quality Compass (1997); OECD Health Data (1996); Canadian Council on Health Services Accreditation Quality Care and Services (1995); Provincial Health Council of Alberta (1997); FACCT (1997); CRISP (1992) Healthy People 2000: National Health Promotion and Disease Prevention Objectives (1991).

ceptual model for framing and organizing the inventory emerged. Figure 1 visually represents the indicators collected and their relationships to each other in an understandable framework.

In this model the health status of the individual, family, and community are of central importance, with both objective and subjective components, wherein health is influenced by all other areas of the model and vice versa. Surrounding and intersecting "health of the individual/family/community" are the determinants of health, including a space for determinants yet to be identified. A larger circle, representing public policy and research, surrounds health status and health determinants, indicating that public policy and research can influence both.

Following development of the framework, the indicators submitted by the regions and provincial health authorities were categorized. Indicators were collapsed

Figure 1. Model for Health Indicators Framework

using a two-stage small group process to allow for verification, to ensure consistency in the grouping of the indicators, and to reduce duplication and retain validity. After additionally reviewing how the regions used an indicator, it was finally placed in one of the categories identified within the model.

RESULTS

All 17 health regions in Alberta as well as the Provincial Mental Health Advisory Board and the Alberta Cancer Board participated in the survey. In total, 1,647 indicators were identified. The number of indicators received from each region ranged from 15 to 409 with an average of 75. The inventory revealed 21 indicators being measured, in some fashion, by the majority (≥ 10) of health regions/provincial health authorities (Table II). While these indicators do not represent a strategically defined or jointly agreed upon common core set of health status indicators, they may provide a starting platform for future planning. Regional responses to the survey were not uniformly comprehensive. The "indicator name, definition, source" and whether it was "current or planned" were the most frequently completed questions. Approximately 75% identified a "formula used for measurement". "Who uses the information, for what purposes" and "the validity

of the survey tool" questions were completed less often. Issues of balance and overlap also became evident from the survey results. For example, most regions identified many more health system indicators than other health determinant indicators and some indicators were associated with multiple health status constructs, raising concerns for the validity of the indicator.

An unexpected result was that Alberta Health performance measures, in place at the time of the survey, were not always included in each region's list of indicators. The majority of indicators submitted were health system output measures such as numbers of clients seen, number of separations, and productivity or workload indicators. Some regions identified specific measurement tools without linking the instruments to any particular health indicators. Responses to the surveys not only elicited indicators collected at a system or population level but also included program-specific or individual measures. Many of the indicators submitted were similar across programs, with the potential to be collected as a common core subset of program indicators.

A lack of standardization and validation of indicators was evident. Frequently, indicator names were the same, yet collected and reported differently by regions. For example, "population" varied in definition and/or data source from one region to

another. Complex concepts such as "health" were also measured differently across regions – some used subjective methods (e.g., self-rated health status) while others used objective methods (e.g., hospital morbidity) or a combination of both. As well, methods of calculation for indicators varied from region to region. While some regions focussed on particular population subgroups – e.g., children or seniors – others used total population figures or population figures within specific age groups to report their findings, often with age categories differing from one region to another. The method of reporting varied from total numbers to proportions by age and gender while others reported rates per 100,000 population.

As requested, many of the regions identified indicators that were not currently being measured but were planned for measurement in the future. In some cases, regions stated that they planned to collect indicators at a frequency that is not possible given the timing of release of data. For instance, some regions listed Canada Census as a source for data to be collected on an annual basis, even though the federal census is conducted every five years. Often data sources for current and planned indicators were not identified. In other cases, both primary and secondary sources were identified for the same or similar indicators. An immediate challenge identified was the reduced frequency/availability of municipal surveys/census information due to reorganizations of planning commissions and funding reductions to municipal governments. These findings raise issues concerning the realistic availability of data for some planned indicators.

DISCUSSION

This inventory of indicators used in Alberta Health Authorities presents an opportunity for all stakeholders to work together to clearly articulate, collect and share standardized definitions and measures of common indicators already in use. With the model they provide a reference point for regions, a framework upon which to begin to communicate regional information needs. From this starting point, additional refinement and development of

other commonly required indicators could be undertaken.

It is recognized that significant progress toward indicator development has been made in some regions since the distribution of this survey. The collection of indicators received represents a snapshot of indicators locally known or in use at a given point in time. Therefore, as with all such single, cross-sectional surveys, it has some limitations. These include an inability to capture the dynamic ongoing process that indicator development entails, or the variations in progress being made before and since the survey was completed; however, diversity in quantity, breadth and progression toward indicator development and outcome measurement was still apparent within the confines of the study design. Also, the variation in terms used to describe outcome indicators throughout the literature may have resulted in non-report of some indicators, such as the "performance measures" specified by Alberta Health, that may not have been recognized as "indicators" by some regions. Subsequent phases of indicator development could address these inconsistencies and extend completeness of the inventory.

The inventory of regional indicators reflects the challenges faced in measuring the achievement of "healthy Albertans in a healthy Alberta."⁹ Measures range from the protection and improvement of the health of the population to the response of the system to the needs of individuals, families and communities. Looking at all of the indicators collectively, a holistic view of health and the health determinants is represented. That is to say, the regions view health as more than just the absence of disease. On an individual regional basis, however, the holistic view of health was not always as apparent.

There is increasing demand that organizations provide measurable evidence that structures and processes of the organization work together to achieve the intended results and improve the health of the individual/family/community. Traditional measures of input (e.g., number of hospital beds, number and types of staff) and output (e.g., number of persons attending a program, number of beds utilized, number of persons receiving screening tests, average length of stay) have been documented by survey respondents as important decision-

making tools across the continuum of care. These measures provide valuable information regarding the efficient and appropriate use of resources; however, information concerning the links between results (e.g., health outcomes) and enabling processes (both inside and outside the health system) is also being recognized as essential. While difficult to measure quantitatively and often complex in nature, linkages provide critical additional information. Examples of these links include 1) the link between percentage of children immunized (system output) and the communicable disease rate (outcome), and 2) the link between readmission rates (outcome) and early postpartum discharge (process). There is a need to broaden the range of important and acceptable indicators to include those that help to *qualify* as well as *quantify* progress towards health goals and outcomes... "If improved practice or process cannot be linked to improved outcomes one must question whether all the resources used to modify the process were well spent."¹⁰

In addition to being understandable, timely, relevant and reliable, indicators need to provide intra-regional and inter-regional comparisons over periods of time. To facilitate this, common definitions and sources of information and standardized data groupings must be negotiated. Steps have been taken by health-related groups having common goals of consistent collection and reporting of data sets. These include initiatives by CIHI, CCHSA, regional health authorities, provincial departments of health, and Health Canada. For example, a pilot project initiated by CIHI in conjunction with the CCHSA has been designed to evaluate the reliability and usefulness of six generic indicators.¹¹ In addition to those indicators collected by the health sector, cross-sectoral collaboration related to data collection and reporting was evidenced in the regional indicators submitted. New partnerships that bring together broader ranges of stakeholders are emerging and should be supported.

CONCLUSIONS

The results of the survey confirmed the regional and inter-regional issues initially identified by the SEARCH participants – those of inconsistency, non-comparability of measures between regions and, in many

cases, the determination of indicators based upon data currently available versus upon identified information needs. In contrast, the survey also helped to identify areas in which commonalities exist, providing a stepping stone upon which to begin the development process toward a common set of indicators. The Model Health Indicator Framework uses indicators and measures already familiar to the regions. The perspective chosen provides unity by dovetailing well-known concepts into a comprehensive and holistic model, and allows for ongoing identification and refinement of measures of health status and determinants of health. It will be important to move towards a commonly shared, consistently defined and validated core set of indicators in the same spirit of collaboration that allowed the inventory to be constructed. Developing and sharing a core set of health indicators and health outcome measures across the province could contribute significantly to defining and maintaining health priorities consistently and equitably in all parts of the province and for all population groups.

Wider lessons from this work suggest the following needs:

- *Champions* (e.g., SEARCH) – if you want a survey of this magnitude to succeed and create common vision;
- It helps to have a *political driver* – (e.g., larger political effort was being driven by provincial business planning requirements and a move towards greater accountability);
- *Time* – moving towards common indicators is not a fast process;
- *A phased approach* – moving when and where there is the opportunity to move;
- *Pragmatic action* – if you can link and work together, that is helpful but not always feasible or timely;
- *Multi-level action* – there are different levels of discussion and action (the central level is not the only place where activity around indicator development can be driven – collaborative action at the regional level is also essential); and
- *Sustainability* – committed effort over time is both critical and problematic as people, positions and priorities change.

If these needs are met within the process of indicator development, individ-

ual authorities are less likely to push forward in isolation and the capacity for greater sharing and collective adaptation is maintained. There appear to be many commonalities in the type of indicators needed by health authorities and other related sectors; many are similar to those identified by CIHI. National and provincial governments are pursuing the refinement of indicators that already have a defined database source. Forums also need to be established that are multi-sectoral and multi-regional in design, that can further elucidate and expand the range and consistency of shared and valid health indicators. These efforts are required in order to push the boundaries beyond what is currently available and easily collectable. Additional collaborative action could help ensure common data collection methods, extend the range of sharable health indicators, and enhance transferability of information concerning the health status of various populations across Canada.

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