

## Round Table

# Health information system reform in South Africa: developing an essential data set

Vincent Shaw<sup>1</sup>

**Abstract** Health services are increasingly under pressure to develop information systems that are responsive to changing health needs and appropriate to service objectives. Developing an essential data set provides managers with a clearly defined set of indicators for monitoring and evaluating services. This article describes a process that resulted in the creation of an essential data set at district level. This had a significant impact on neighbouring districts and resulted in the development of a regional essential data set, which in turn helped to influence the creation of a provincial and then national essential data set. Four key lessons may be drawn from the process. The development of an essential data set both requires and can contribute to a process that allows the reporting requirements to be adjusted over time in response to changing circumstances. In addition, it contributes to (and requires) the integration of programme reporting requirements into a coherent information system. While the case study describes a bottom-up approach, a top-down consultative process is advocated because it establishes a framework within which information needs can be reviewed. Lastly, the use of surveys can aid efforts to keep the essential elements to a minimum. In conclusion, the development of an essential data set contributes to strengthening health services because it necessitates dialogue between programme managers and defines indicators to be monitored by them.

**Keywords** Information systems/organization and administration; Health status indicators; Data collection/methods; Community health services; Delivery of health care; Program evaluation/methods; South Africa (source: MeSH, NLM).

**Mots clés** Système information/organisation et administration; Indicateur état sanitaire; Collecte données/méthodes; Service public santé; Délivrance soins; Evaluation programme/méthodes; Afrique du Sud (source: MeSH, INSERM).

**Palabras clave** Sistemas de información/organización y administración; Indicadores de salud; Recolección de datos/métodos; Servicios de salud comunitarios; Prestación de atención de salud; Evaluación de programas/métodos; Sudáfrica (fuente: DeCS, BIREME).

الكلمات المفتاحية: نُظْم المعلومات، مؤشرات الوضع الصحي، جمع المعطيات، طرق جميع المعطيات، الخدمات الصحية المجتمعية، إيتاء الرعاية الصحية، تقييم البرامج، طرق تقييم البرنامج، جنوب أفريقيا. (المصدر: رؤوس الموضوعات الطبية، المكتب الإقليمي لشرق المتوسط)

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Voir page 635 le résumé en français. En la página 636 figura un resumen en español.

يمكن الاطلاع على الملخص بالعربية في صفحة 636.

## Introduction

Increasingly, information systems for monitoring health services are being scrutinized for their appropriateness and ability to provide meaningful information to managers (1–4). The vision of the District Health Information System (DHIS) developed in South Africa is “to support the development of an excellent and sustainable health information system that enables all health workers to use their own information to improve coverage and quality of health care within our communities” (5). According to the basic principles of the DHIS, it supports the district-based primary health care approach, collects essential data used to calculate indicators, encourages decentralized use of information by health workers, includes all service providers at all levels, and integrates with and supports other information systems.

Over the past 10 years, a comprehensive primary health care information system has been developed in South Africa. One of its key elements is an essential data set, which may be defined as a set of the most important data elements, selected

from all primary health care vertical programmes, that should be reported by health service providers on a routine basis, with the aim of being able to generate indicators that monitor the provision of health services in an integrated manner. An essential data set is thus important in that it contributes to the principles listed above and facilitates decentralized use of information by health workers because their monitoring needs are clearly defined.

There are two key messages in this definition, contained in the linked concepts of integration and an essential data set. Programme managers (e.g. coordinators of the Expanded Programme on Immunization (EPI) and programmes for women’s health, HIV/AIDS and sexually transmitted infections, and tuberculosis), in an effort to ensure that all angles of service delivery are taken into consideration, often require a very large amount of information for their specific programmes. Their primary concerns are their programme needs, and little attention is given to the means of collecting the information or

<sup>1</sup> Manager, Health Information Systems Programme, School of Public Health, University of the Western Cape, South Africa (email: vshaw@his.org).  
Ref. No. 04-015032

Vincent Shaw

the needs of other programmes. The requirements of various programmes may duplicate each other, and the vertical reporting of this information often requires separate data collection tools. As a result, the health worker is faced with a myriad of books and forms, all used to collect information for specific managers, but with little integration and no vision of its use at the local level. Experience has shown that the larger the number of data elements to be reported upon, the poorer the quality of the data (6, 7).

The creation of an essential data set is based upon two key principles: limiting the routine reporting requirements for primary health care and hospital services to a set of 100–150 data elements, enabling the calculation of 80–120 indicators; and integrating the reporting requirements of various programme managers, so that their needs are contained within the set of essential data elements and indicators.

This article describes a process that resulted in the creation of an essential data set at district level. This had a significant impact on neighbouring districts and resulted in the development of a regional essential data set, which in turn helped to influence the creation of a provincial data set.

## Developing an essential data set at district level

In a remote district in the northern part of the Eastern Cape Province, the district management team found that the data collected by the clinic staff seemed inappropriate for the adequate management of services. Until then, data had been submitted to the head office on a routine (quarterly) basis, but no feedback was ever received. The requirements for data submission had been determined by head office staff many years earlier and had not been revised to accommodate recent changes in the priorities for health service delivery.

The decision to review the data collected at facility level took place in 1994, when the “new” South Africa was requiring an increasingly decentralized management structure and greater transparency in terms of access to information and health statistics. In addition, the focus had shifted significantly from a hospicentric health service to a health service orientated towards primary health care.

The district team evaluated all the services that they were providing, and identified data elements or indicators that would accurately monitor these services. This exercise included a process of evaluating existing data elements being collected. For each data element that health workers wanted to be included, they had to answer the questions: Why do we want to collect this information? How will we use it? The answers should underpin the need to monitor the integrated strategic plan for the district. If the health workers could not come up with a reasonable answer to either of the questions, the data element was discarded or reformulated so that the questions could be answered.

A long list of data elements and their associated indicators was developed. Then began a process of whittling away at the list until about 70 elements remained, which were considered the most essential data elements required to calculate about 75 indicators. This set of indicators was small enough to allow management to focus on the key aspects of service provision, yet was large enough to monitor services across all programmes. It provided management with an integrated system for assessing services. Along with the data elements and indicators, a set of data collection tools was developed.

### Box 1. An essential data set must be able to accommodate changes over time

There were a number of important modifications that came about as a result of the process of establishing an essential data set. One example that highlights how experience influenced the development of the data set hinges on the data elements collected for antenatal services. Two of the antenatal indicators were:

- antenatal coverage (first antenatal visit divided by the expected number of pregnancies in the women of childbearing age);
- average antenatal visits per antenatal client (first antenatal visit plus follow-up antenatal visit divided by the first antenatal visits).

The district management team found a very high antenatal coverage rate in the district (112% for January–December 2000); with an average of three antenatal visits per antenatal client, it was apparent that the pregnant population was able to access the required services. The next step was to seek to improve the quality of services by first determining the percentage that accessed the services within the first 20 weeks of pregnancy and, if necessary, increase it. The team’s gut feeling was that a very low percentage actually accessed services in the first trimester. Hence a new, more specific indicator was introduced and the existing data element “First antenatal visit” to be split into: “First antenatal visit within first 20 weeks of pregnancy” and “First antenatal visit after 20 weeks of pregnancy”.

## Managing upwards: the district influences the region

As the district implemented the new system, adjoining districts came to learn about the new data set and its efficiency. Gradually, pressure from other areas within the region to implement the same data set mounted; as a result a regionwide consultative meeting was convened, at which the district data set was assessed and adapted to accommodate the needs of the region. This, in turn, resulted in the region approaching the province to reduce the number of indicators being reported upon; finally, after some time, the province approached the national administration, and in June 2002 a national workshop adopted an essential data set for the country.

## Important lessons learned from this process

### Reporting requirements must be able to change over time

Changing needs of patients require changing reporting requirements, as evidenced by the emergence of the HIV/AIDS epidemic and increasing access to antiretroviral therapy. In the case of the HIV/AIDS epidemic, managers at the central level have generally been responsive to the needs of patients and the reporting requirements of donors. The reality is, however, that these managers operate from positions of power and are able to impose reporting requirements even if they have not been well thought through. Managers at facility level may have a better grasp of the needs of patients, but they have less influence in making these needs known. The result is that once reporting needs have been defined, they remain cast in stone.

Reviewing reporting requirements requires a broadly consultative process between managers of different programmes in order to ensure that duplication is avoided. This is not easy to achieve.

As managers use information, their understanding of its meaning improves and their demands become more sophisticated. Bodart & Shrestha (8) describe four types of indicator

(count, proportion, rate and ratio). Our experience has shown that managers are initially most comfortable identifying count indicators (e.g. number of patients with hypertension). They should be encouraged to look beyond this, however, to identify how they would use this count indicator to improve service delivery. This often leads to the development of indicators which bring in another data element as the denominator, creating one of the other three indicator types. Box 1 provides an example from which it can be seen that an atmosphere needs to be created where the review of reporting requirements is acceptable, even the norm. This needs to be the case both at the central and the peripheral levels.

**Programme reporting requirements must be integrated in order to ensure the development of coherent information**

There should be agreement among programme managers to adhere to the principle of developing an integrated data set. In the absence of this, health workers at the facility level are likely to have to cope with uncoordinated and often duplicate demands for information that will result in their being distracted from their primary function — providing health services. An example would be where the nutrition programme requires reporting on the number of children under five years of age attending the clinic, number of children weighed, and number of children with malnutrition. In order to be sure that facilities report on these elements, the programme develops a data collection form specific to its needs. At the same time, EPI requires reporting on children attending under two years of age, and

immunizations given to them (BCG, DPT1-2-3, OPV1-2-3, etc.). It also develops a report format specific to its needs. Both these programmes are targeting the same population group, without considering that, from a health care worker’s point of view, the child who needs to be immunized also needs to be weighed and given vitamin A, and in the clinic it is the same health worker who provides all these services. Adopting an integrated approach would ensure that systems are developed which complement each other and are appropriate to the manner in which services are delivered.

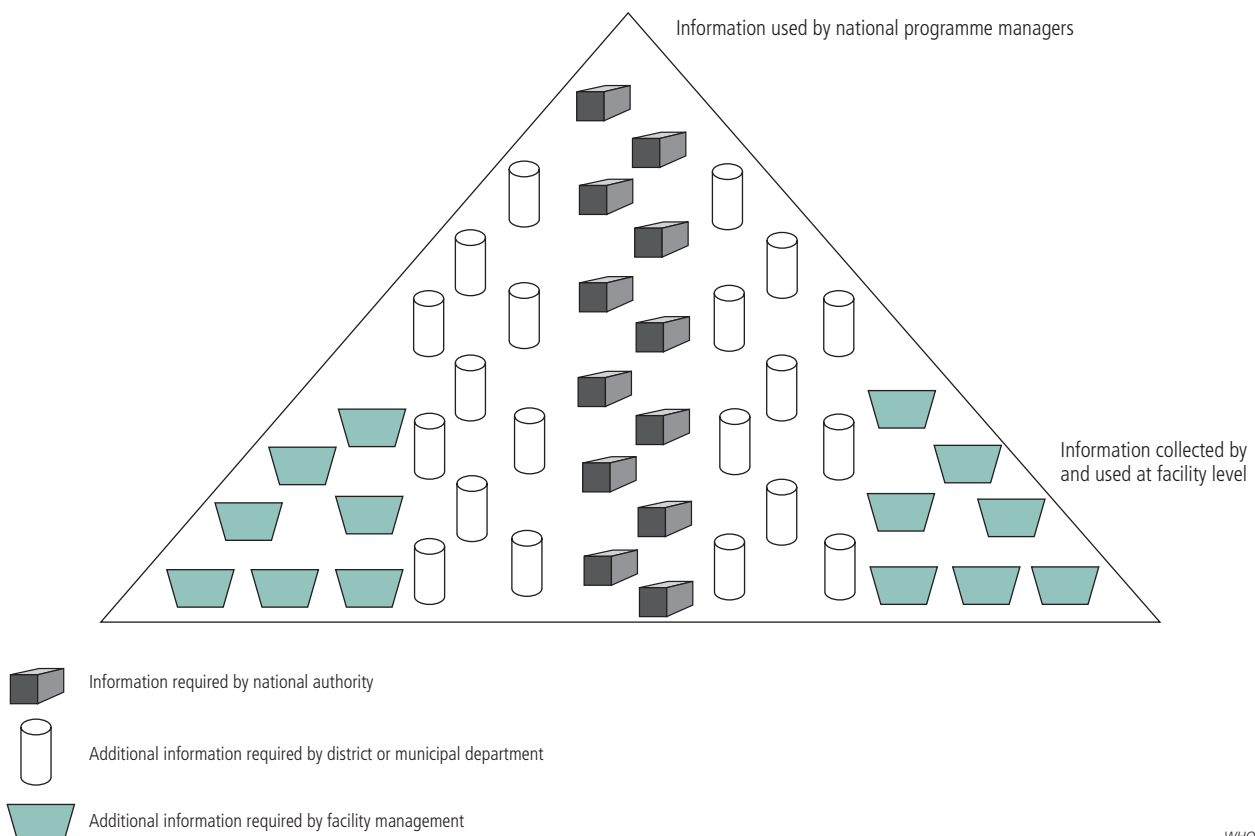
An integrated data set also provides managers at facility and district alike a clearly defined target to work towards, both in terms of collecting and using the information.

**A top-down consultative process establishes a framework for review**

The creation of an essential data set for South Africa began as a bottom-up process. Decentralized districts are often less bureaucratic in nature than central systems, and more responsive to the changing needs of patients. As a result, they are able to see the need to revise reporting requirements and are able to effect a change reasonably easily. It is also easier to bring different programme managers together at district level, to ensure integrated reporting.

A more strategic position to adopt, however, would be for a national ministry to take it upon itself to facilitate the development of an essential data set for the country. A concept in support of this process is a hierarchy of information needs (5, 9).

Fig. 1. The hierarchy of information needs



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A hierarchy of information needs operates at the following levels.

1. A national ministry determines an essential data set — this is the minimum reporting requirement for all facilities and health service providers in the country.
2. The next level of management (a region or province) adds indicators that they believe they should collect in order to be able to manage their services efficiently (e.g. in the example in Box 1 the original indicator was split in order to obtain more detailed information).
3. A district management team adds to the regional essential data set indicators they believe are important to manage their services (e.g. a district wants to improve the supervision process in clinics, so monitors the percentage of planned supervisory visits undertaken).
4. A facility develops an essential data set which includes indicators from the ministry, region and district, as well as their own indicators (e.g. if facility staff want to confirm that they carry an increasingly large workload of patients from outside their official catchment area, they develop an indicator “Percentage head count attendances from outside the catchment area”). The type of information important for a facility management committee, and possibly for a district, is not necessarily relevant at the national or regional levels.

Applying the concept of a hierarchy of information necessitates adherence to the principle of only transmitting the information that is required to the next level. With the advent of computers, and patient-based information systems, the temptation to transmit all the information through to all levels must be resisted.

### Additional information can be collected through specific programme surveys

In order to ensure that the essential data set is limited in size, it is necessary to provide programme managers with an alternative mechanism for collecting programme data outside the routine reporting system. This is done by using surveys.

Surveys should be used to gather information that will complement the routine reporting. As some indicators do not change much over time, they do not need to be reported

on monthly — they could be collected annually or quarterly through the use of surveys. Typical contents of a survey questionnaire would be questions about quality of care, availability of equipment, staffing and budget allocations. Surveys can be used creatively to strengthen health services. For example, it may be that in order to reduce the cost of surveys, a three-year rolling plan is developed, ensuring that each year a third of all facilities are surveyed: all are surveyed over the three-year period. A survey data set would contain core information that is common to all the years, and additional information could be changed from year to year according to need.

### Conclusion

Developing an essential data set provides managers with a clearly defined set of indicators for monitoring and evaluating services. The process of developing an essential data set can strengthen the health services and the health information system because it requires coordination of reporting requirements among programme managers, and the creation of a framework for reviewing information needs over time. Applying the concept of a hierarchy of information needs allows each level within the health service to develop its own data set, while still responding to the needs of the central administration. This encourages the use of information at a local level because each level has been involved in determining the indicators and data elements that are collected. Annual surveys can be used to complement routine reporting, enabling the essential data set to be kept to a minimum. ■

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## Résumé

### Réforme du système d'information sanitaire en Afrique du Sud : mise au point d'un jeu de données essentielles

Les services de santé sont de plus en plus incités à développer des systèmes d'information réagissant à l'évolution des besoins sanitaires et répondant aux objectifs de service. La définition d'un jeu de données essentielles fournit aux gestionnaires une série d'indicateurs clairement définie permettant de surveiller et d'évaluer les services. Le présent article décrit un processus aboutissant à la création d'un jeu de données essentielles au niveau du district. Cette opération a eu un impact important sur les districts voisins et a conduit à la mise au point d'un jeu de données essentielles pour la région, processus qui, à son tour, a contribué à l'élaboration d'un jeu de données essentielles à l'échelle de la province, puis du pays. Quatre enseignements peuvent être tirés de cette expérience. La mise au point d'un jeu de données essentielles nécessite un processus permettant d'ajuster les exigences de notification

au cours du temps en réponse à l'évolution des circonstances, processus auquel elle peut en même temps contribuer. En outre, elle facilite (et impose) l'intégration des exigences de notification des programmes dans un système d'information cohérent. Bien que l'étude de cas décrive une démarche partant de la base, un processus consultatif descendant est préconisé car il fixe un cadre dans lequel les besoins en information peuvent être analysés. Enfin, la réalisation d'enquêtes peut contribuer aux efforts pour limiter le plus possible le nombre d'éléments essentiels. En conclusion, la mise au point d'un jeu de données essentielles participe au renforcement des services de santé car elle implique un dialogue entre les directeurs de programmes et la définition d'indicateurs que ces derniers doivent surveiller.

## Resumen

### Reforma de los sistemas de información sanitaria en Sudáfrica: desarrollo de un conjunto de datos esenciales

Los servicios de salud se encuentran sometidos a una presión cada vez mayor para desarrollar sistemas de información sensibles a las nuevas necesidades de salud y apropiados para alcanzar los objetivos fijados. Un conjunto de datos esenciales puede dotar a los administradores de un abanico claramente definido de indicadores para vigilar y evaluar los servicios. En el presente artículo se describe un proceso que permitió crear un conjunto de datos esenciales a nivel de distrito. Ello tuvo importantes repercusiones en los distritos vecinos y condujo a desarrollar un conjunto de datos esenciales de ámbito regional, lo cual influyó a su vez en la creación de un conjunto de datos esenciales provincial y más tarde nacional. Cabe extraer del proceso cuatro importantes lecciones. El desarrollo de un conjunto de datos esenciales exige y al mismo tiempo puede favorecer un proceso que permita ajustar

las necesidades de información con el tiempo en respuesta a la evolución de las circunstancias. Además, propicia (y requiere) la integración de los requisitos programáticos en materia de presentación de informes en un sistema de información coherente. Mientras el estudio de casos describe un enfoque ascendente, aquí se preconiza un proceso consultivo descendente, pues así se establece un marco en el que pueden analizarse las necesidades de información. Por último, la utilización de encuestas puede ser una ayuda para reducir al mínimo los elementos esenciales. En conclusión, el desarrollo de un conjunto de datos esenciales contribuye a fortalecer los servicios de salud porque requiere que haya diálogo entre los gestores de los programas y define los indicadores que éstos deberán vigilar.

## ملخص

### مائدة مستديرة إصلاح نُظُم المعلومات الصحية في جنوب أفريقيا: إعداد مجموعة المعطيات الأساسية

الوقت، وتساهم في تلك العملية نفسها للاستجابة للظروف المتغيرة. وبالإضافة إلى ذلك فإن هذه العملية تساهم في إحداث التكامل بين متطلبات الإبلاغ في البرامج وبين نظام متسق للمعلومات، كما أن هذه العملية تتطلب ذلك التكامل أيضاً. ورغم أن الحالة المدروسة تصنف أسلوباً ينطلق من القاعدة ويتجه للقمة فإن ما ينصح به هو اتباع عملية تشاورية تبدأ من القمة وتتجه للقاعدة، لأن ذلك يرسخ إطاراً يمكن أن تراجع الاحتياجات من المعلومات ضمنه. وأخيراً يمكن لاستخدام المسوحات أن تقدم المساعدة للجهود المبذولة للمحافظة على العناصر الأساسية في حدها الأدنى. وبالنتيجة فإن إعداد مجموعة المعطيات الأساسية يساهم في تعزيز الخدمات الصحية لأنها تجعل الحوار ضرورياً بين مديري البرامج كما أنها تحدد المؤشرات التي ينبغي عليهم رصدها.

تعاني الخدمات الصحية من تزايد الضغوط عليها لإعداد نُظُم معلومات صحية تتسم بالاستجابة للاحتياجات الصحية المتغيرة وللأغراض الملائمة من الخدمات. ويتيح إعداد مجموعة المعطيات الأساسية للمديرين مجموعة من المؤشرات المحددة تحديداً ووضوحاً لرصد وتقييم الخدمات. وتصف هذه الورقة عملية انتهت بإعداد مجموعة المعطيات الأساسية على مستوى المقاطعة. وقد كان لهذه العملية تأثير واضح على المقاطعات المجاورة وأدت إلى إعداد مجموعة المعطيات الأساسية على صعيد المنطقة، والتي ساعدت بدورها على التأثير لإعداد مجموعة المعطيات الأساسية على صعيد الولايات، ثم على الصعيد الوطني. وهناك أربعة دروس مستفادة من هذه العملية. ويتطلب إعداد مجموعة المعطيات الأساسية عملية تسمح بتعديل متطلبات الإبلاغ مع مرور

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## Round Table Discussion

### Information is not only for managers

Richard E. Cibulskis<sup>1</sup>

The product described by Shaw — a simplified health information system implemented on a national scale — is not new (1, 2). What is interesting is the bottom-up process, as it is quite unusual for systems originating in one district to take hold over a wide geographical area. This may be because some districts are reluctant to use a system designed by other districts or because they do not have the same resources for implementation. Whatever the circumstances, bottom-up processes can produce a variety of incompatible information systems, each competing to be adopted as a national standard. South Africa does not appear to have succumbed to this problem, but it is still not clear if its system really works. It would be instructive to learn more about its reporting rate from institutions. This is a good indicator of an information system's performance as it requires several basic processes to be fulfilled, such as a complete listing of reporting units, compliance with reporting requirements and processes for monitoring compliance. A good reporting rate is also critical to the eventual interpretation of indicators.

Whether a top-down or bottom-up approach is preferred, the design of health information systems requires a clear understanding of why data are being collected; ultimately they should influence the behaviour of those in control of resources in ways that will enable the health sector to achieve its objectives. Data should certainly be used by health managers to plan and monitor programmes, enabling them to allocate resources to priority health problems or populations. The information required for this task, however, is wider than that provided by routine health information systems. Some relevant data systems — for population, finances, and staffing — are managed by other government departments, while some information is collected through censuses or surveys (particularly if many services are delivered through non-government providers). An optimal information strategy needs to consider how the different sources of information will work together. For example, it should be clear about the definitions of indicators and the coding systems used for geographical units. Some form of centrally coordinated approach seems inevitable. Such coordination should not be mistaken as being set up for the purpose of supplying central level managers with information: although they might benefit from information, they rarely have the capacity or authority to respond to large quantities of data. Rather, central coordination is primarily to bring together data from districts so that they can be summarized in such ways that districts can compare their performance with that of others.

Health managers are often ineffective users of information, despite efforts to train them, encourage them or provide them with new information systems. Time and again, inequities or inefficiencies in the use of resources go unheeded. This may be because health managers have little influence over key

decisions in government or perhaps because they are not motivated to respond. There is a growing awareness that if we are interested in enhancing the performance of the health sector then external uses of information can carry greater weight than internal uses (3). Thus, public disclosure of information can help “politicians, patients and citizens to scrutinize the operations which they are financing” (4) and in this role it can encourage managers to be more responsive to their clients' needs. Similarly, information can be used by health managers to lobby external authorities for greater support. If external uses of information have greater impact than internal uses, should not the health sector take this into account when designing its minimal data sets? It may be that the minimal data set for politicians, citizens and the treasury are the same as that for health managers, but not necessarily so. Citizens may be more interested in learning whether basic inputs such as staff and drugs are available, whereas a ministry of finance may be interested in learning whether national development priorities are being delivered. Whatever the final content, minimal data sets need to begin with the key users and uses of information and they should not remain the preserve of health managers. ■

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### Indicators for a health information data set in Ghana

Sam Adjei<sup>2</sup>

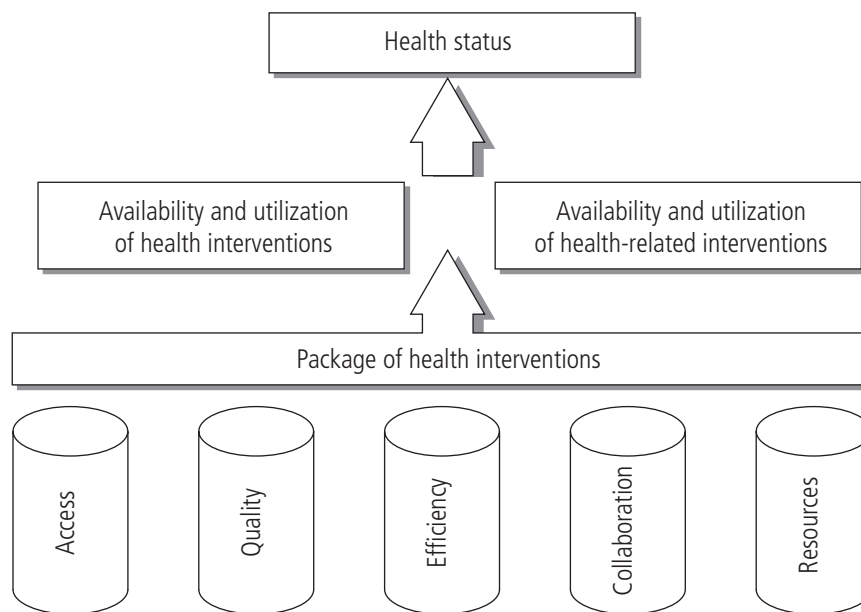
A health information system handles the recording, storage, retrieval and processing of health data. Broadly defined, the health information system should cover such data sources as vital registration, censuses, routine service-generated statistics, population-based surveys and research information, in order to provide evidence for decision-making in the health system.

Assessments of health information systems have given rise to several misgivings. Foremost among them is the fact that multiple data sources are not linked to each other; indeed, different instruments may generate different data on the same person or event. Routine service data are collected with the needs of higher-level programme managers and donors in mind; in addition, they may be incomplete or of doubtful quality, and timeliness can be a problem. Surveys are useful, but they tend to be expensive and donor driven and are often not linked to routine service data. Research data are generally available but are rarely included as part of the health information system because research is conducted outside the scope of ministries of health. Dissemination of the information collected is usually

<sup>1</sup> Monitoring and Evaluation Advisor, World Bank Office Jakarta, Jakarta Stock Exchange Building Tower 2, 12th floor, Jl Jenderal Sudirman Kav 52-53, Jakarta 12190, Indonesia (email: rcibulskis@worldbank.org).

<sup>2</sup> Deputy Director-General, Ghana Health Service, Private Mail Bag, Ministries, Accra, Ghana (email: sam.adjei@hru-ghs.org).

Fig. 1. Conceptual framework for health sector reforms and information



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weak and its use, particularly in policy-making, is infrequent. Several efforts undertaken to strengthen health information have not taken into account any general framework for designing the information system.

The paper by Shaw describes efforts to correct the multiplicity of data sets in South Africa, especially at the periphery, without describing an overall framework for how this is to be achieved. Even though the process reported has reduced the data set to 100–150 elements and 80–120 indicators, the numbers still appear too large to manage effectively. An overall vision of health information needs in the context of health development is important even at the district level beyond programme managers. The current wave of health sector reforms and health system strengthening will require this broader context for the development and standardization of health information.

In Ghana, a conceptual framework for health sector development (health sector reforms) helped to generate indicators for health information (see Fig. 1). This framework allows data required for policy development, priority setting and programme performance measurement, as well as monitoring and evaluation, to be determined in the sector as a whole. Sector-wide indicators that fell into three main categories were agreed upon; 20 indicators are collected and used at all levels, which does not exclude the use of more indicators at any level.

The three categories of indicator concern: health status, including mortality and morbidity; programme output, covering programme performance in public health and clinical care interventions as well as health-related indicators such as enrolment at school; and systems development, in which a package of five cross-cutting areas of access to care, quality of care, efficiency in the use of resources, collaboration with other sectors (communities, other providers of care, other ministries and donors) and financing of care is determined. Indicators in the first two categories are easily developed but are more difficult to define in the third category, where methods of data collection

are also difficult as the indicators do not lend themselves to routine service statistics and surveys may be needed.

The impact of the process adopted in the South African experience is commendable, as it appeared to influence other districts, the regions and national levels. Its impact at the global level is not indicated but, given that global initiatives and donors have major information requirements, a process that links with global development is important.

With this in view, the Health Metric Network initiative is timely. Particularly welcome is the development of a simple framework to define the scope of the health information system. The framework should serve as a diagnostic tool for evaluating the state of a country's health information system, a road map for developing plans for improvement, and a process for monitoring and evaluating progress. Its application at the country level should build on experiences such as that described in South Africa. ■

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## A data warehouse approach can manage multiple data sets

Jørn Braa<sup>1</sup>

Development of essential national indicators and data sets — or national *standards* — is regarded as the key issue in country health information system reform. Most countries, however, fail to achieve this goal. The reasons are: fragmentation (difficulty in reaching agreement on standards across health programmes); focus on reporting rather than on use of data and information; constantly changing needs (e.g. with regard to HIV/AIDS); and standards that are “cast in stone” (software and paper tools are difficult to change).

<sup>1</sup> Department of Informatics, University of Oslo, PO Box 1080, Blindern, Norway (email: jbraa@ifi.uio.no).

Despite these problems, South Africa has managed to develop national standards that are flexible enough to “absorb” local innovations and changes over time. The following points may help to explain why this is so.

- The “hierarchy of standards” (“information needs” in Shaw’s figure) has been a powerful tool to negotiate a balance between the national needs for control with the local (e.g. province or health programme) needs for flexibility or more data. While all health units are required to collect and report the core national data, they are at the same time allowed to collect their own additional data.
- Use of information is highlighted by linking data sets to targets and indicators.
- The flexible approach to standards following the hierarchy makes it easy to absorb and implement changes over time; there is no “final” data set. Local innovations are allowed for and may eventually be included in the national data set.
- The flexibility of the South African District Health Information System (DHIS) database application is crucial to managing the ever changing national and local data sets. Data elements, indicators and data sets are added, edited and managed by the health services themselves, thus making it possible to manage multiple data sets at district level. This “data repository” or “warehouse” approach may be a key to how the lessons from South Africa could be applied in other countries.

Over the years, I have been involved in efforts to apply the South African lessons in many countries. It has not been easy. National health information system databases and reporting formats tend to be rigid and unable to respond to changes, thus leading to fragmentation of the system. The HIV/AIDS programmes are currently aggravating this situation.

So what can be done? Current efforts to establish integrated data sets in contexts as different as Addis Ababa (Ethiopia), Botswana, Zanzibar (United Republic of Tanzania), Andhra Pradesh (India) and Ho Chi Minh City (Viet Nam) may provide some answers. Here data sets from all or most programmes are combined and streamlined by sorting out overlaps, gaps and inconsistencies. Following the South African district data warehouse approach, the combined essential data set is then further improved and reduced by focusing on the need-to-know indicators. Programme-specific software applications are linked electronically to the DHIS, thus providing a shared data repository. The objective of integrating all indicators relevant to the Millennium Development Goals has proven important in building consensus.

Purists may argue that the data warehouse approach based on flexible standards advocated here is violating the spirit of the South African *minimum* essential data set approach, by taking a combined — *maximum* — data set as the point of departure. It may, however, be the most appropriate way to apply the South African indicator-driven approach in a situation increasingly dominated by strong programmes and multiple uncoordinated data sets and software applications. ■

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## The data set must focus on service quality

Jens Byskov<sup>1</sup> & Oystein Evjen Olsen<sup>2</sup>

The paper by Vincent Shaw highlights some of the long awaited practical approaches to ensure relevance and use of health information systems in developing countries. The South African experience he recounts is very relevant as current “best practice”. It is a very important step forward in the simplification and integration of programme areas and routine services into a shared essential set of routine data. The cohesion of health services and the whole system will be much strengthened by such a shared data reference and information base.

The essential data are still to be selected by programme managers, however, even though the definition of the data set emanated from the district level. It is not shown how the data will be turned into useful information that will assist in planning and monitoring at all levels of the health system. The examples taken from the nutrition programme and the Expanded Programme on Immunization only exemplify health status (outcome) and service provision (output) data.

In the section on specific programme surveys, resource and staff availability are mentioned as well as service quality. It is worrying that these are not shown to be included in an essential routine data set, as it is extremely important that an essential data set allows production and sharing of information on health management. It is also not shown whether quality of care will be viewed from both provider and user perspectives and whether user views on service priorities and other qualitative data are included.

In Shaw’s figure, the column of information used by the national level on a routine basis within the triangle of information should be seen as the core data on facility performance that must be shared in an accessible database for the whole health service and other parts of the health system, and be available for sharing with users and the public.

The information needs triangle could also be depicted as service quality at the bottom, supervision and coordination needs at the intermediate level, and policy needs at the top. The main focus of the data set must be on service quality, with less emphasis on supervision and coordination and even less on policy. Service quality must relate to health management, service output and outcomes as viewed from both the provider and the user sides.

The number of data elements and indicators still seems to be high in relation to similar elements in the core part of the health information system in other African countries and may indicate a still limited degree of compromise and shared focus between the levels and programmes. A stronger emphasis is needed on the iterative nature of the health information system, and not so much on annual or quarterly “reporting”. We need to move away from a culture of reporting to a culture of using the data for ourselves — facilities or districts first — on a continuous basis. Benchmarking and quality assurance processes exemplify some useful frameworks for continuous use of data. ■

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<sup>1</sup> DBL-Institute for Health Research and Development, Jaegersborg Allé 1D, Charlottenlund, DK-2920 Denmark (email: jbyсков@dblnet.dk). Correspondence should be sent to this author.

<sup>2</sup> DBL-Institute for Health Research and Development, Primary Health Care Institute, Iringa, PO Box 105297, Dar es Salaam, United Republic of Tanzania (email@dblnet.dk).