

III. RESOURCE GENERATION FUNCTION

1. WHR 2000

In WHR 2000 the available evidence on the links between the resource generation function and health-system performance was summarized. WHO argued that whatever the level of inputs, there was an efficient way to combine them. Significant imbalances between different types of productive resources existed in many settings, and countries must address a number of complex questions such as:

- What is the most cost-effective balance between different types of productive resources and how can this be achieved?
- How much effort should be devoted to developing new resources (e.g., investment) compared with developing strategies and incentives to improve the use of existing resources?

No attempt was made to define or measure indicators of how the resource generation function was being performed. Health expenditure per capita was the only source of information on health-system inputs used for performance assessment.

2. Main commentaries and criticisms

There were few comments and criticisms of the WHO approach to this function apart from the general comment that WHO needed to develop the links between each of the four key functions and the performance of the system as a whole (WHO Regional Office for the Americas 2001).

Human resources were seen as particularly important because health systems are labour-intensive and expenditure on personnel is usually the largest single item of recurrent health expenditure. Health systems require not only a sufficient number of qualified and experienced staff to function well, but an appropriate mix between the different types of human resources. Changing the mix will not, however, solve all problems and some commentators (e.g., DfID 2000) suggested that special attention should also be paid to the following issues:

- the difficulty of reorienting staff from one activity to another
- the problem of low productivity of human resources which was seen to be linked closely to the issue of remuneration;

- development of ways to measure and improve the quality of human resources, perhaps linked to realistic estimates of the level of outputs that the various inputs might be expected to deliver (DfID 2000).

Similar comments were made in relation to physical capital where deficits in the stock of assets (e.g., buildings and equipment) can be a real constraint to the delivery of effective interventions. Conversely, it is not uncommon to find health systems where there has been significant investment in physical infrastructure but where recurrent budgets do not allow for staff costs or the maintenance of the physical capital stock, which results in efficiency losses. Goal attainment is a function of the number and type of health facilities and equipment available. Various types of incentives and legislation influence how capital is purchased, used and maintained. Hence it is not just a matter of counting the availability of resources, but of ensuring that the mix is appropriate and the resources are used efficiently (Anell and Willis 2000).

3. WHO responses and proposals

WHO has proposed a set of indicators for each of the four key functions, which will help decision makers identify practical areas where performance can be improved. For the resource-generation function, WHO proposes to focus on investment in the production of resources and maintenance of their quality and productivity. The management and deployment of resources will be assessed under the service-provision function.

Generation of human resources for health

The following indicators are proposed:

- Total annual investment in human resources (HR) as a percentage of total health expenditure;
- The number of new entrants to educational institutions that train health-care professionals divided by the total stock of health-care personnel;
- The total stock, composition and distribution of human resources for health;
- Migration of human resources.

As an input to this exercise, it will be necessary to explore the feasibility of estimating the quantity of different types of labour inputs currently available to the health systems of Member States. To do this, WHO will develop a global database on human resources. Data will be collected on the quantity and characteristics of different provider groups, partly through the World Health Survey (for which a draft survey module has been developed).

WHO also proposes to develop a human resources policy. The purpose will be to synthesize the evidence on the effects of different human resources policies on the performance of health systems. This will allow different parts

of WHO to work together to develop a coherent set of strategies that can help Member States to improve the performance of this function. The Organization acknowledges that there is a strong need for capacity building in countries to achieve effective policy-making in this area.

Physical resource generation

The following activities are proposed by WHO:

- (i) To explore the feasibility of estimating the quantity of different types of capital stock (e.g., health facilities, equipment).
- (ii) To develop and apply methods for measuring the physical capital stock available to the health system (e.g., the value of buildings and equipment).
- (iii) To monitor:
 - Annual new investments in health facilities as a percentage of total health expenditure;
 - Annual expenditure on maintenance as a percentage of annual investment in health facilities;
 - The total stock of facilities (current value) as a proportion of GDP.

Pharmaceuticals and medical devices

WHO proposes to measure investment in medical devices as a component of its work on health facilities. Measuring the availability and utilization of essential drugs and other consumables is included in WHO proposals to define indicators of the health services provision function (Section IV).

Knowledge

WHO proposes to measure total annual investment in health research and development. WHO has also started a process to develop the performance assessment of health research systems, and plans to publish its findings in WHR 2004.

4. SPRG comments and recommendations

Human resource generation

SPRG supports the need to develop indicators for each of the four functions of the health system, including resource generation. *Inter alia*, this will help to generate evidence about the influence of the composition of human resources on the attainment of health-system goals.

Among the problems related to human resources, the lack of standardization in definitions of human resource categories needs to be addressed. More

attention also needs to be paid to non-medical professionals and the migration of human resources.

The methodology proposed by WHO for estimating National Health Accounts (NHA) incorporates an additional category of expenditure – investment for human resource generation (production and continuing development). SPRG believes that 'annual investment in human resource generation as a percentage of total health expenditure', one of the indicators proposed by the Secretariat, is too general as an indicator of efficiency for the human resource generation function. The inclusion of maintenance costs for human resources is also desirable in an assessment of efficiency, even though it may be difficult to collect these data. WHO should explore whether maintenance costs could be included as part of NHA.

Concerning the breakdown of human resources categories, SPRG questions whether the six provider categories proposed by WHO are sufficient. Other categories such as public-health physicians, preventive-care professionals and traditional health-care providers might also be important. On the other hand, SPRG recognizes that too many categories may overburden health-information systems and make data collection difficult.

Owing to the functional substitution between different categories of human resources, which often occurs in resource-poor areas, data on the quantity and characteristics of selected categories may not represent the functional profile of human resources in certain areas.

There is concern about the apparent tendency of WHO to follow the trend of focusing on curative care that is observable in many countries. It is recommended that WHO should pay more attention to traditional public-health occupations in its work on human resources.

SPRG recommends that WHO reviews its work on the migration of human resources with a view to developing an indicator that takes into account the dynamic character of the process.

Indicators to assess performance of human-resource generation should follow the general framework of HSPA, i.e., they should include the quantities of resources available, their distribution, and their efficiency.

Members of SPRG expressed the need for a parsimonious set of indicators related to shortage (demand minus supply), equity (distribution), and efficiency of human resource generation. One possible approach may be summarized in the two tables below.

III. Resource Generation Function

Table 1. Matrix for the assessment of human resource generation

Selected categories	Level			Equity		Efficiency of production
	Adequacy (number, density)	Skill mix	Quality	Fairness of finance of HR production	Distribution of new entrants	
Doctors Nurses Midwives, Public-health workers, Dentists Pharmacists, Managers, Traditional health workers Etc.					Composition (social, demographic, income)	Per capita investment (Investment per trained person)

Table 2. Matrix for the assessment of human resource maintenance and utilization

Selected categories	Level		Equity	Productivity
	Remuneration	Incentives	Distribution	
Doctors Nurses Midwives, Public-health workers, Dentists, Pharmacists, Managers, Traditional health workers, etc.	Possible indicators: - Range, - Timelines (are the salaries paid on time, regularity of payments), - Adequacy (e.g., in comparison with other countries in the region or countries with similar national income)	Non-pecuniary	Distribution among socio-demographic groups	Possible indicators: - No. of Full-Time Equivalents (FTE) per bed occupancy in hospital, or - No. of FTE per visit

These suggestions are made for consideration and further development by WHO.

Physical resources

Investment decisions have an impact on the type of services provided and the geographical distribution of the services. The health system needs to

take account of the current condition of the health-care facilities infrastructure, i.e., the physical capital stock.

For operational efficiency, no standards exist either on the proportion of total health expenditure that should be devoted to investment in physical infrastructure, or on the ratio of maintenance and operating costs to investment.

SPRG welcomes the approach proposed by WHO to establish a core set of equipment to be measured, which can be used to assess resource availability, and to test the feasibility of collecting such information in demonstration countries.

Specific comments on data for indicators:

(i) What to collect. For estimation of the current value of physical inputs, a standard procedure needs to be applied so as to assure comparability across countries. In the first instance, WHO should collect data only on the number and type of selected facilities, equipment, etc., their anticipated physical depreciation, and their distribution in each country. Subsequently, appropriate modelling needs to be undertaken for the imputation of values.

(ii) Sources of data. In general, no agency collects data on the number and types of all fixed assets. Central and local governments often have statistics on specific equipment, e.g., MRI and CT scans. WHO should collect the necessary data but avoid duplication with other data-collection bodies. Financial reports to statistical authorities are a cheaper source of data than direct measurement strategies, although they may be partial. Given different arrangements in countries concerning ownership and management of buildings, information on public facilities may be available only in separate reports (provider reports show only maintenance and operating costs; local government reports include the value of buildings and their depreciation). In consequence, additional surveys may have to be undertaken.

Pharmaceuticals and medical devices

SPRG supports WHO proposals for including pharmaceuticals and medical devices as important resources to be measured.

Knowledge

SPRG commends the WHO initiative to measure the performance of national health-research systems and publish its findings in WHR 2004. The lessons learned from HSPA will be useful in this respect.

5. References

Anell, A. and M. Willis (2000): International comparison of health care systems using resource profiles. *Bulletin of the World Health Organization*, 78(6): 770-778.

DfID (Department for International Development, UK Health Systems Resource Center) (2000): World Health Report 2000: Summary and comments. Draft 10 July 2000.

WHO Regional Office for the Americas (2001): Regional consultation of the Americas on Health Systems Performance Assessment: Final Report. 8-5-2001, Washington, D.C.

