Developing an information system to support the pursuit of decentralization

The perspective of Ceará State in Brazil

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Introduction

The process of health service decentralization and the idea of setting the unified health system in Brazil goes back to 1963 when the issue was discussed at the third National Health Conference. However, in 1988 together with the new Brazilian Federal Constitution, the Unified Health System was created stressing health promotion, prevention and treatment for all Brazilian people. The guiding principles for restructuring the health sector were [1,2]:

- Political and administrative decentralization, underlining the role of the municipalities in defining, managing and carrying out health activities.
- Integration of the governmental institutions, with a single management system for each level: federal, central and local.
- Social control allowing the participation of various social organizations in the creation of local health committees for the identification of problems and in the definition of their solutions.
- Development of comprehensive health care with promotive, preventive and curative activities.

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- Use of data in identifying priorities, allocating resources and establishing plans and programmes.

Ceará State, with its estimated population of 6,700,000 is one of the 26 states of Brazil. While its economy grew by 10.8 per cent in 1994, illiteracy among females over 15 years of age reached 33.0 per cent. About 32.5 per cent of the breadwinners have an estimated income of D90,00 per month; 60.2 per cent of the households have not got adequate water supply; 90.0 per cent lack adequate sanitary facilities; and 36.0 per cent do not have appropriate waste disposal[3].

Until 1988 there was a weak administrative structure of the municipalities in Ceará State. At local level there were very few health posts and some small municipal hospitals. On the other hand there was a concentration of specialized hospitals in the towns. In 1989 an agreement was reached between the State Health Secretariat and the municipalities to develop a health plan and create the Municipal Health Council. The State Health Secretariat was responsible for financing the needed infrastructures during the first phase. Later, municipalities assumed the overall responsibility of the health system at local level including the administrative aspects. The process of decentralization in Ceará State has been implemented faster than in other states of Brazil. Currently, 124 out of the 178 municipalities have concluded this process and it will gradually be extended over the whole State[4].

The State Health Secretariat is changing its traditional responsibility of co-ordination and execution of all health policies, delegating the responsibility of health service delivery to the municipalities. The State, however maintains the responsibility of co-ordinating, evaluating and providing technical support to the municipalities and managing referral facilities such as specialized hospitals, the Central Public Health Laboratory and the Blood Bank.

It is worth mentioning the National Health Foundation, which continues to carry out activities at all levels, creating a parallel system which is not in line with the new health system. On the other hand, some regions and municipalities have personalized the concept of decentralization by creating a new system of health information and changing the existing tools for data collection. Furthermore, the State Health Secretariat has not yet transferred many of its personnel to the municipalities and still maintains the control of public hospitals. Consequently, the process of local planning within the new health policy is affected.

The health information system

The health information system in Ceará State is organized at three levels of the health system: central, regional and local (Figure 1). At the local level all facilities (hospitals, health centres and health posts) are active in data collection. At this level, data collected by the health posts are transmitted monthly to the health centres, whereas data collected by the community health agent are transmitted to the health agent's programme co-ordination in each

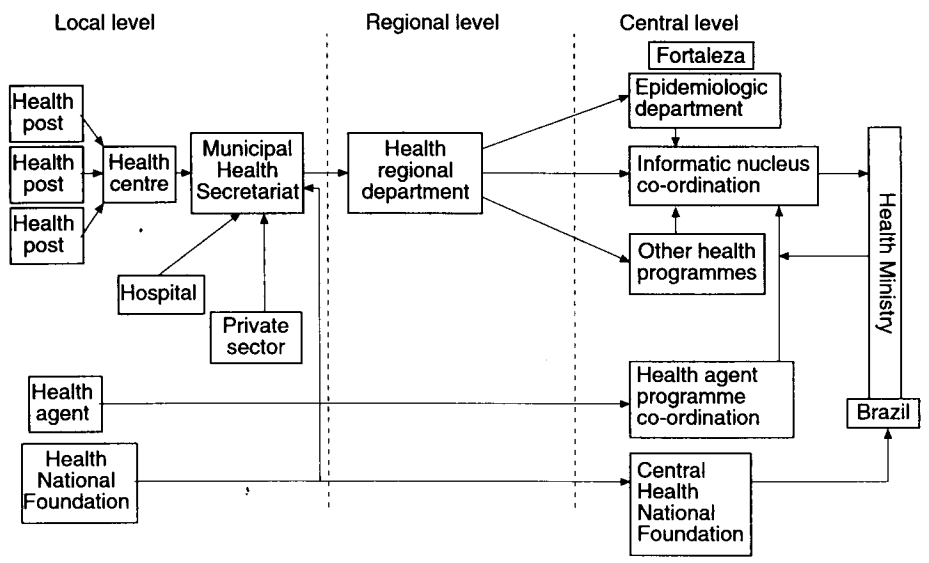


Figure 1.
Organization structure of the health information system

municipality. These data, together with those collected in the health centres and those from the hospitals on in-patients are transmitted to the Municipal Health Secretariat after compilation. The Municipal Health Secretariat consolidates and transmits the data to the Regional Health Department[5]. This process of bottom-up data transmission takes place on a monthly basis, except in the case of notifiable diseases surveillance reports which are submitted to the Municipal Health Secretariat every week.

The Regional Health Department transmits the data received from the Municipal Health Secretariat to the concerned departments of the State Health Secretariat, i.e. the Information Centre, Epidemiological Department and specific programmes such as immunization, live child, live woman, health agent programme, leprosy, tuberculosis and diabetes. The compiled data are then transmitted to the Information Centre and Epidemiology Department at the central level which compile all the data coming from the regions and vertical programmes and send them to the Ministry of Health in Brasilia.

Functioning of the health information system

The main burden of data collection takes place at municipal level, which is the most peripheral unit in the structure. Community Health Agents collect data regarding the number of families living in the villages, number of pregnant women, number of pregnant women seeking antenatal care, birth weight, growth monitoring, breast feeding, nutritional status of the children, immunization status and deaths. The health post, which is the basic unit of the health system, collects data on immunization, antenatal care, wounds treatment and drugs consumption. The health centre collects the same data as that of the

health post plus data on the live child programme, live women programme, oral health, tuberculosis, leprosy, diabetes, hypertension, AIDS, sexually transmitted diseases and other notifiable diseases. In addition, the health centres collect data concerning the total number of examinations carried out by medical laboratories and data regarding mortality and natality. Hospitals on the other hand collect data on in-patient activities such as: morbidity, mortality, causes of death, immunization of newborns, notifiable diseases, laboratory examination, X-rays, number of deliveries, drug utilization, etc. Data on endemic diseases are, however, collected by the National Health Foundation.

Use of computers

Computers are not used at local level. However, the study revealed that 22.3 per cent of the respondents at regional level and 77.0 per cent at central level make use of various computer packages for data processing as shown in Figure 2. Two out of the three regional health departments carry out data analysis with the use of the computer. Lack of knowledge on proper use of the computer is the reason why they are not being used sufficiently at regional level.

At central level, it is observed that important information such as age, sex and diagnosis related to the users of out-patient services, is lost due to the complexity of the database used.

Information flow, feedback mechanism and information use

The information system should meet the needs of the front-line workers who play a key role in providing care according to need. The information should

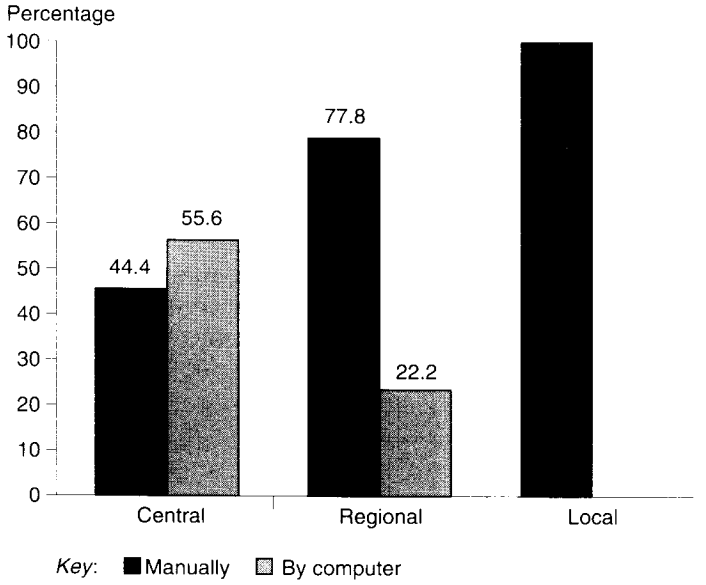


Figure 2.
Methods used to analyse data at different levels in Ceará, Brazil, 1994

help the workers to identify and follow up those in need of their services. In Ceará State, reports with indicators are produced quarterly by the Planning Assessory and Co-ordination Unit, but not distributed among the health professionals. The Quarterly Report is sent mainly to the State Government where part of it is selected and published together with information from other sectors. Based on this quarterly report, graphs are prepared by the supervisors that show trends to give visual feedback to the community health workers and the community. Presentations are made with the help of these graphs at lane meetings for women, health committee meetings and, in one field site at churches, to inform the community about the activities of the primary health care team and the impact the programme is having on the health status of the population.

At central level, different kinds of information are used, mainly for planning purposes. They are also used to evaluate the health process and to define the needs for training. Information is used to define and evaluate the financial resource distribution and to define the type and quantity of each procedure for each municipality as shown in Figure 3.

At regional level (Figure 4), information, mainly on morbidity and mortality, is used to plan and define strategies of health care as well as to evaluate and monitor health activities. However, at local level, one third of those interviewed stated that either they do not use the information or that they do not know about it.

In spite of the collection of all this amount of data, everything is sent to regional and central level and very little or nothing comes back or is utilized at local level.

Information from both ambulatory and hospital services, i.e. the ambulatory information system and hospital information system, is delivered each month to the national level for the allocation of financial resources.

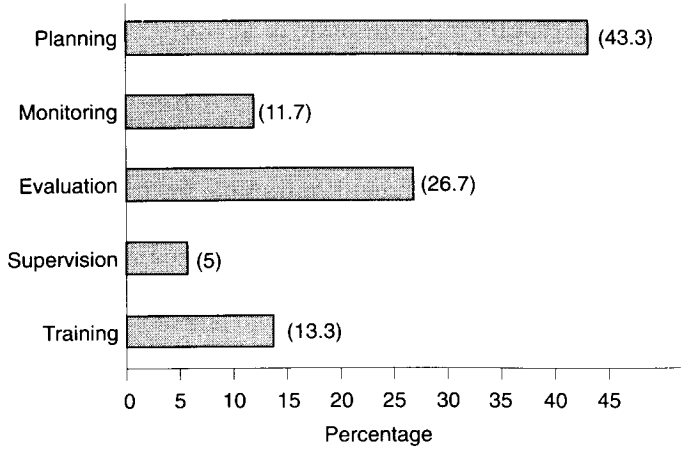


Figure 3.
Information at central level in Ceará, Brazil, 1994

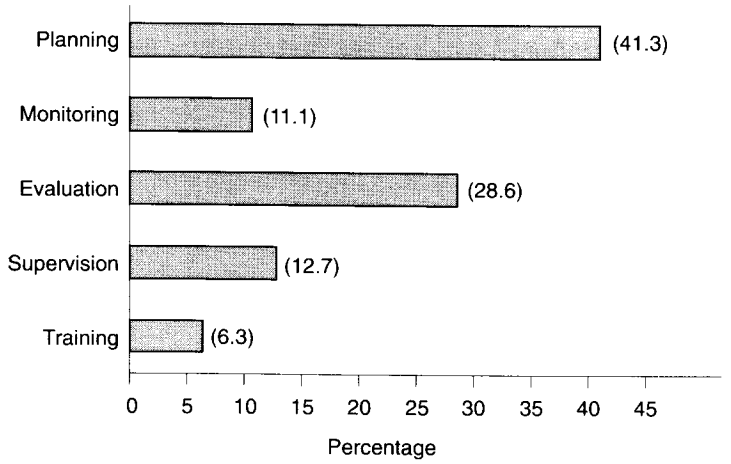


Figure 4.
Information at regional level in Ceará, Brazil, 1994

The Epidemiology Department produces a bulletin with information regarding the number of cases of endemic and notifiable diseases. This publication, supposedly to be released every six months is often irregular.

The immunization programme releases information on vaccination coverage two or three times a year without a predefined timetable. This information is used for discussions in the meetings of representatives of the 14 regional health departments. The regional health department subsequently does the same with the municipalities in its catchment area.

In 1994, the Health Agent Programme started to publish the first semestral report. The information is discussed by the co-ordinator of the programme with the respective community health workers. However, it is not widely disseminated.

Strengths and weaknesses

The process of decentralization in Ceará State is moving very fast. It is also supported by the political and administrative systems. However, it requires technical capability and appropriate tools to use health information for planning purposes. In the State, there is a dominance of vertical health programmes promoted which are supported by international agencies. These programmes which include the Expanded Programme for Immunization, live children, live women and health agents have a centralized core of staff in the State Health Secretariat with their own health information system. However, the programme supporting the community health agents whose data could support the decentralized health planning and management is not given its due importance.

The study has revealed that most of data analysis is carried out at regional and central levels; only a small amount of data is analysed at local level in an

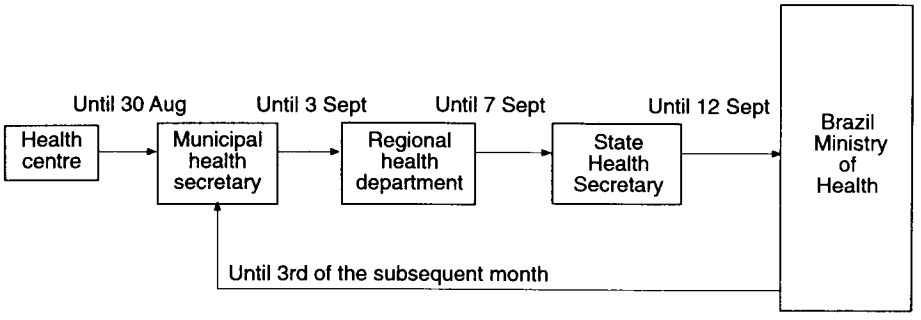
unstandardized way. For example, it is observed that two of the three municipalities visited, Marco and Sao Joao de Jaguaribe, analyse mainly data regarding the frequency of diarrhoeal diseases, immunization coverage and antenatal care, and the third municipality, Catarina does not perform any analysis at all.

The majority of health personnel who were interviewed expressed interest about the possible utilization of data. Fifty-four per cent of them said that they used the information to plan, 16.1 per cent to evaluate health activities, 15 per cent for training health workers, 10.8 per cent for monitoring purposes and 4.3 per cent for supervision activities. Thirty per cent of the interviewed personnel stated that they did not use the information; lack of knowledge was given as the main reason. The type of information perceived as useful at local level was morbidity data, mortality, immunization coverage and natality.

Furthermore, the study has revealed that feedback is poor in spite of the bottom-up data flow which is functioning well, with a precise record compilation and completeness. A data tracing method of 30 days' duration (Figure 5) has been used by the investigators, which has demonstrated time for data flow from the local level, health post, health centre up to the State Health Secretariat.

Personnel involved in decision-making activities are quoted as saying that there is feedback only when there is an emergency, e.g. the recent cholera epidemic. In usual situations feedback is very rare or absent. Even the Quarterly Report produced by the central health information system is not disseminated to the lowest level. There is also an irregularity in the dissemination of vaccination information which is set to take place every three months.

Community health agents are producers of extremely important information which could allow the health posts and the health centres to evaluate their activity continuously and in particular the impact of health care. However, data which is collected routinely by them does not reach the health post; it is transmitted to the health centre and then on to the State Health Secretariat with



Note: Date from 30 August to 30 September (SIA), *Ambulatory Production Bulletin (BPA)*

Figure 5.
Data flow and feedback (30 August -30 September)

no interim analysis. The reason for this poor utilization is due to the fact that community health agents, being created as a vertical programme, are accountable only to the headquarters at central level.

The way ahead

A process of decentralization in Ceará State requires the support of the health information system to make it more functional and responsive to the reality of the area. The National Health Secretariat should revise the existing health information system, decentralizing its data production, allowing the data producers and local health managers to use it for their planning needs.

As described above, the amount of data collected at peripheral level is huge, but only a small amount is actually utilized. This is not to suggest that the amount of information which currently is collected should be reduced, but rather to make maximum use of what is actually collected. Demographic data, for example, should be used for the development of micro-areas of risk as stressed in the decentralization policy of Ceará State. Addresses of patients could also be of great use to define the catchment areas of health facilities and identify uncovered segments of the population. Drug consumption and morbidity data could be useful in drugs quantification and management processes.

The community health agents should be integrated and their data used at local level especially in the health posts and in the health centres, allowing these facilities to become the core structure for a peripheral planning process. Health facilities should be supported in processing and analysis of their own information in order to enable them to identify their own problems and make timely decisions.

In designing and implementing an information system for primary health care, it is crucial to focus on the interface between the front-line workers and the community. A health-care system is more likely to be effective if front-line workers are guided by the management information system so as to know where their efforts should be concentrated[6].

Adequate and timely support for the front-line workers is important. Lack of support may lead to frustration and inaccurate reporting.

Consultation with the community is crucial. Such consultations, which may largely be independent of the formal management information system, enable the teams to improve the quality, completeness and utility of the information obtained.

The health information system supports policy making, decision making and day-to-day actions in a decentralized system by:

- Tracking mortality and costs is one of the key functions of an information system as this information can be used for policy making.
- The health information system can help identify problem areas and training needs based on which corrective action can be taken.

- The information can be used to monitor progress of activities and the achievement of objectives and to plan future strategies and activities.
- The health information system plays an important role in identifying who is to be served, what their needs are, and where they are.
- The information can guide the field personnel and policy makers in adjusting services according to need.

The information system is only useful to the extent that it reflects and supports the goals of the health-care system within which it operates. As changes are made in the health-care system, the health information system should be adapted to meet new challenges.

Improving health information system involves trade-offs between the implementation of necessary change and the retention of a familiar system with its weaknesses. Unless such trade-offs are made in favour of change, the system may be in a prolonged state of under-achievement.

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