

COMMUNITY HEALTH ASSESSMENT: A SYSTEMATIC APPROACH

MIRIAM J. STEWART
Assistant Professor, School of Nursing
Dalhousie University

INTRODUCTION

Nurses are continually being told to become more familiar with the health care delivery system in which they function. Their traditional tasks have been to prevent and intervene in illness, and to promote and maintain the health of individuals and families. Accordingly, when community health nurses are asked to identify and meet the needs of a more complex client — the community — they are frequently overwhelmed. The proliferation of survey approaches available (Bell and Newby, 1974; Poplin, 1979) does not make the task easier.

As one of three nurse investigators asked to develop a comprehensive baseline study of a particular community's health needs, I found that a systematic approach to assessment was uniquely beneficial.

This article focuses on the use of general systems theory (Von Bertalanffy, 1968) as a framework for community analysis. It provides an overview of the systems theory terminology relevant to community assessment and briefly describes the community involved. It also outlines the inherent advantages and disadvantages of the approach.

THEORETICAL FRAMEWORK AND REVIEW OF THE LITERATURE

Systems theory terminology used in this article includes:

- (1) the *system*, a set of interdependent components, objects, or elements interacting and interrelating
- (2) the *subsystem*, the component parts, units, or elements of the total system
- (3) the *boundary*, an arbitrary line that encircles these parts, producing parameters, limits, and a filtration medium for the system
- (4) the *environment*, those factors external to the system's boundary, including ones that affect and are affected by the system (McKay, 1969; Hazzard, 1971; Chadwick, 1972; Archer and Fleshman, 1975).

If the human body was used as an example of a system, the organs could be identified as subsystems, the skin as the boundary, and clothing as the environment.

Systems can be *closed* or *open*, according to whether they communicate with the environment (Hazzard, 1971; Chadwick, 1972). Closed systems do not interact with their environment, but depend on their internal resources for survival. Open systems, on the other hand, freely exchange matter, energy, and information with their environment. They are self-regulating, adapting according to environmental feedback. Although open systems retain resources for their own survival, their dynamic exchange of materials, energy and information with their surroundings stimulates internal growth.

According to this definition, then, individuals, families, and communities can be classified as open, living systems (McKay, 1969; Leighton, 1971; Hall and Weaver, 1977). The goal of nursing assessment and intervention should be to promote optimum functioning, adjustment, maintenance, organization, adaptation, and growth (Archer and Fleshman, 1975; Putt, 1978).

THE COMMUNITY AS A SYSTEM

A community is a social system encompassing the physiological, psychological, and social facets of individuals and families (Report of the PAHO/WHO Committee on Textbook Programs, 1976). Further, it includes the organizations and institutions that carry out diverse functions including stratification, control, socialization, production, and communication (Anderson and Carter, 1974; Moe, 1977). As an open system, it is thought to be unique in its ability to meet the individual's needs (Harmston and Lund, 1967; Bruhn, 1975; Poplin, 1979; Roberts, 1979).

The basic resource of a community system is its human *energy*. Its health depends on the ability of individuals and groups to direct the flow of energy by working toward common goals (Hanchett, 1979).

The community as a client, then, must be assessed comprehensively as an interdependent unit of complicated social relationships (Wilson, 1970; Bell and Newby, 1971; Leighton, 1971). Health care, as one subsystem, is an integral part of the whole community system. Like any other subsystem, it should not be considered on its own (Wilson, 1970; Braden and Herban, 1976).

To analyze the community system as a whole, outside influences of government organizations, other communities, and society at large must also be considered (Hall and Weaver, 1977). Psychosocial as well as biophysical aspects of the environment must be determined when evaluating a community's health. Health workers recognize, for example, that fumes from a neighboring steel plant can pollute the community's air; that sewage from a town upstream can poison the drinking water; and that illegal drug trafficking can infiltrate into the community from a metropolitan center. The community depends on the inflow of products and human energy from the environment (Braden and Herban, 1976; Roberts, 1979). If the rate, quality, and quantity of the input and output (matter, energy and information) are controlled, an ideal *steady* or *homeostatic* state of self-regulation is achieved (McKay, 1969).

Community changes are therefore complex, and must be made within a framework that ensures they agree with the goals of each subsystem and of the community as a whole. A change in one part of the community produces change in other parts and change in one community can create change in another (Roberts, 1979). Planning for only one dimension of health ignores the fact that this dimension is part of a larger system. All community sectors affect health and all sectors can be substituted for the health subsystem in improving the health status of the population. Furthermore, acceptance of a holistic approach to health care planning involves moving from incremental systems improvement to creative systems design (Dever, 1980).

General systems theory implies a unique method of planning and decision-making that focuses on each subsystem individually without losing sight of the totality. The emphasis is on complex relationships and interdependencies, rather than on constant attributes as in a community survey or descriptive study; this ensures comprehensive analysis and conceptualization.

Systems analysis reveals community patterns used historically to meet needs as well as current resources and variables influencing planned change (Braden and Herben, 1976). It predicts the effect of new external forces and indicates intervention points. Like the concept of *system linkage*, systems analysis assumes that communities are not discrete self-contained groups but are connected to other communities and to the wider societal *suprasystem* (Roberts, 1979).

Systems theory analyses have been applied to urban metropolitan communities, primarily by economists interested in public investment planning (Jonassen and Peres, 1960; Harmston and Lund, 1967;

Steinitz and Rogers, 1970; Chadwick, 1972; Bourne, 1975). In contrast, Cardoza et al. (1975) and Raeburn and Seymour (1977) developed non-mathematical systems for assessing community mental health services and needs.

A systems theory-based approach to community health assessment is notably absent from nursing research literature (Highriter, 1977). Nurse educators and practitioners have advocated the use of nursing process (Knight, 1974), epidemiology (Ruybal et al., 1975) and survey listing (Wagner, 1976). Putt (1978) and Helvie (1979, a and b) used either systems theory or adaptations of it to analyze the individual and family. McKay (1969) stated that the taxonomic development of the subsystems of large systems such as communities should precede the study of functional relationships. When systems theory was applied to discussions of community health (Braden and Herban, 1976; Hall and Weaver, 1977), community subsystems and elements were not clearly identified although Hanchett (1979) has developed a relevant conceptual tool kit approach. Our study of a suburban community presented a unique opportunity to develop a *model* for systematic community health assessment.

THE COMMUNITY

A Nova Scotian suburban community, located 24 kilometers outside a major metropolitan center, had experienced a remarkable six-fold population growth from 6,000 to 30,000 in less than a decade, although it had been in existence for over 200 years. The community was created artificially; government financial assistance had precipitated rapid land acquisition and cooperative housing construction in the area.

As in many middle-class suburban towns, most of the residents were young married couples with two children. In the community, 75 percent were 44 years of age or younger; only five percent were over 60. The majority worked outside the community: many of the male wage earners were in the military service and away from home for extended periods. These factors, as well as inadequate public transportation and a congestion of cooperative and mobile homes, contributed to increased social and emotional health problems. The economic pressures of owning a home, as well as personal bankruptcy, marital discord, parenting problems, juvenile delinquency, depression, and loneliness concerned the citizens. Development of recreational, social, educational, and other health-related services had "reportedly" not kept pace with the structural growth of the community.

Surveys in that community indicated that isolation, family breakdown, and financial difficulties were the most pressing problems affecting the population.

COMMUNITY ASSESSMENT: METHODOLOGICAL APPROACH

To describe the community from a systems theory perspective, we first arbitrarily defined the community's boundary along geopolitical lines. These lines encompassed two provincial districts, distinguishing the community from its environment and, in particular, from the neighboring metropolitan center. This arbitrary line could have been drawn around emotional ties, ecological problems, identifiable needs, organizations, kinship groups, power structures, social classes, and special interests (Archer and Fleshman, 1975).

Once we determined the boundary, we then considered the dynamics of the community based on the premise that each subsystem is likely to have independent goals which, when combined, support community-wide goals. To do this, we identified for analysis not only the health subsystem, but also the subsystems of communication, economy, education, law, politics, recreation, religion, and social life (Figure 1). Subsystems were derived from the review of the literature (Wilson, 1968; Bruhn, 1975; Cardoza et al., 1975; Wagner, 1976), from consultation with experts in community study, and from a preliminary survey of community components.

To understand the changing nature of the community, we examined the historical as well as current influences on each subsystem. Proposed services and anticipated needs were also identified.

We gathered data on the community system and its environment from census tracts, bylaws, government documents and reports, implemented or proposed research projects within the community and vicinity, minutes of community meetings, newspapers, program pamphlets, slides, maps, and historical books. The primary source of information, however, was the citizens.

Interviews were primarily semi-structured and tailored to the person or agency representative being interviewed. Sixty community leaders or decision-makers were identified, using the reputational technique discussed by Bell and Newby (1974), Cardoza et al. (1975), and Poplin (1979). That is, many people who were interviewed suggested other influential, knowledgeable community residents. The list of potential interviewees, as well as relevant written sources of data, thus expanded very quickly. Observation of the layout of the community was only a minor part of the study.

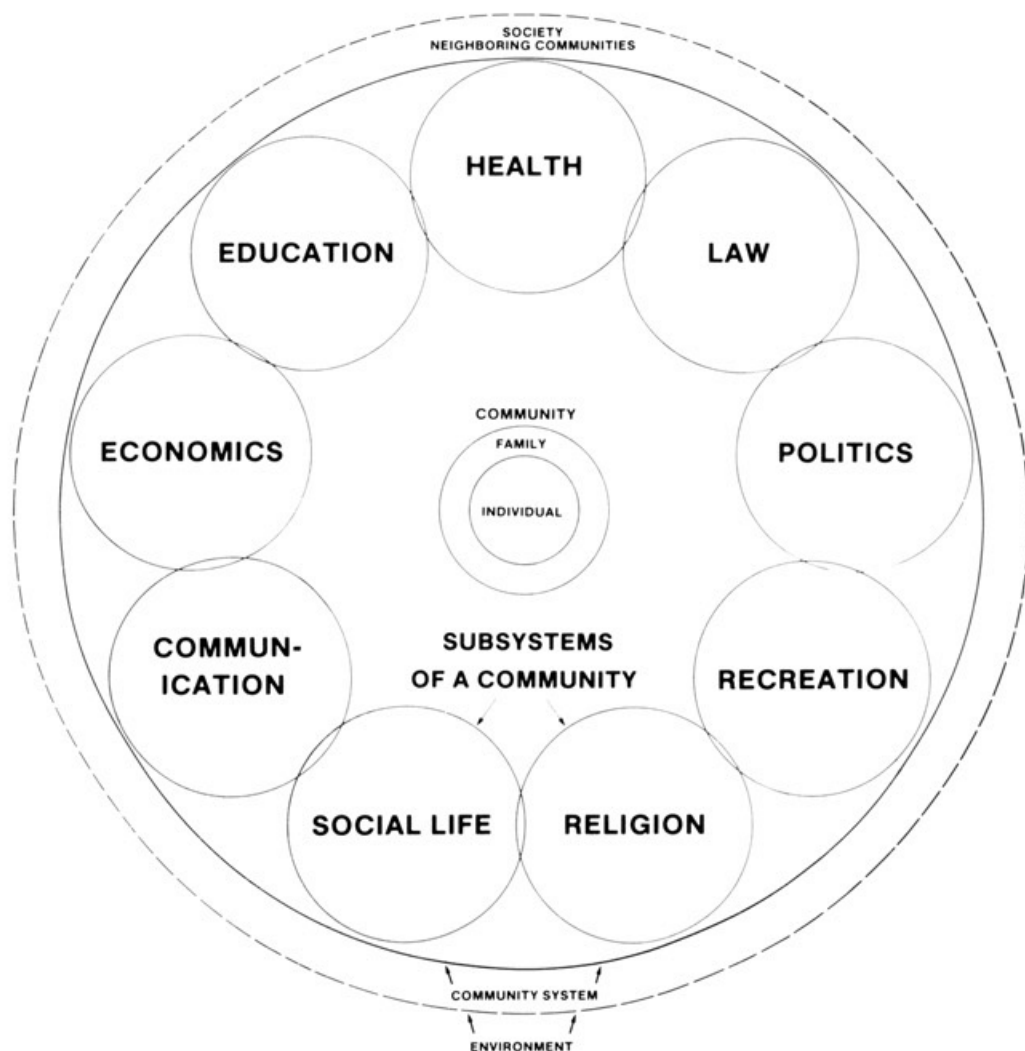


FIGURE 1

Quantitative and qualitative data were compiled for each subsystem. Statistics on population characteristics, personnel, facilities, services, programs, and caseloads of health-related agencies were gathered as well as information on issues, perceived problems and proposed solutions. All information was then classified according to positive and negative influences on health, and compiled into a summary statement. This statement formed the basis for the model of community assessment presented in this article.

MODEL OF COMMUNITY SYSTEM AND FINDINGS

Health

To accurately assess health in a community, the life expectancy, population growth, health status, nutritional status, health services, resource allocation and utilization, and level of social functioning should be considered in addition to more traditional disease-oriented measures of mortality, morbidity and disability (Hulka, 1978; Mooney and Rives, 1978). Basic information should be gathered on the community's health care facilities including the foci of clinical programs and the age groups served. Ambulance and sanitation services need to be identified. Data on the number, type, and routine caseloads of health professionals such as community health nurses, public health inspectors, nutritionists, dental hygienists, family physicians, and specialists should be compiled, as well as information on paraprofessionals and consumer participation in community health programs (Thompson, 1980).

Information on customary sources of health knowledge and prevalent health concepts is also important but more difficult to define. Telephone books often provide residents with data on formal agencies and available services, although only the grapevine reveals informal health-related resources (Hanchett, 1979). Levels of immunization among children; the value the population places on health; the view residents have of their own health status; the geographic, economic and cultural accessibility to health services; lifestyle data including rationale for seeking health care and risk taking; and the environmental condition of air, water and soil all reflect the physical and emotional health of community members (Dever, 1980). The interrelationship and interplay of the subsystems of communication, economy, education and social life with health become evident.

Sanitation reports indicated that this Canadian community was almost totally serviced, although many residents were concerned about the intermittent pollution of the lakes and the site of a garbage dump. Depression was prevalent, judging by "Helpline" statistics; mental health visits constituted a considerable portion of public health nursing caseloads as did prenatal classes and newborn visits. The fact that there was no hospital meant that residents in need of acute care had to travel to the nearby metropolitan center. Most clinics, such as those for child guidance and family planning, operated on a "satellite" part-time basis from the neighboring city. Ambulance services were duplicated by the fire department's emergency rescue truck and a private company.

At the time of the study, ten general practitioners, four specialists, six dentists, four public health nurses, two public health inspectors, and one nutritionist worked in the community. When surveyed, health services rated high among requested improvements in community services. Community debate focused on whether the community should have an emergency care facility or a broader-based community health center.

Communication

The health of a community depends on the ability of individuals and groups to work towards common goals. They cannot work together unless they exchange ideas and feelings. Informal internal exchanges between local subsystems — horizontal patterns — and formal external exchanges between the system and the environment — vertical ties — enhance the system's in/through/output of matter, energy, and information (Hall and Weaver, 1977; Hanchett, 1979). There must be a reaction to feedback if people are to remain satisfied with the community system and if the system is to survive. A public forum for individuals and groups to express their views is one source of feedback for the community (Roberts, 1979). Others include telephone services, mass media and roadways. Although roads are the most visible system network, telephones and mass media also provide system linkage. Telephones promote communication among residents while newspapers provide a steady flow of information on community activities. Finally, transportation can greatly influence physical access to health care in a community system. Access to recreational, educational, and other facilities also indirectly affects health.

Internal roads and external highways linking the community studied with the nearby city were inadequate, although improvements were planned. Public transportation was virtually nonexistent. Residents believed that such transportation was essential as most families were one-car owners and taxis were financially inaccessible for the average citizen. Both factors contributed to feelings of isolation and alienation. These feelings were voiced by female residents in particular. The local newspaper did, however, promote a sense of community identity, and telephone services were considered adequate. Annual "Community Action Days" and periodic public meetings provided a forum for citizen debate.

Economy

The economic health of the community affects the physical and emotional health of its members. For example, the ability to function, one indicator of community health, can be assessed by the percentage of residents employed or attending school (Hanchett, 1979). If a town has a high unemployment rate, social health problems are frequently widespread. While any assessment should identify a community's occupational health programs and industries, the occupations, income levels, and employment status of its residents as well as the quality and types of housing available should also be considered. Consumer education and manpower development also reflect the effectiveness of the system's throughput mechanism (Dever, 1980). In suburban "bedroom" communities, a substantial portion of human energy is exported to large urban centers where the residents hold jobs. Communities that export more resources than they attract in the form of people and products such as goods, services, goals and values may risk decay or "entropy" (Anderson and Carter, 1974; Hanchett, 1979). Conversely, if a community's commercial and industrial base is strong, the financial support available for health, educational and recreational services is generally substantial.

In the community studied, businesses were primarily of a supportive nature. They determined which products were available for human consumption and so influenced the lifestyle of the citizens. Residents thought that commercial growth would augment the community's tax base. The Chamber of Commerce was actively trying to recruit new industry, home buyers, tourists and customers for local businesses to retrieve the "energy" lost by residents working outside the community. The racetrack was a major tourist attraction. Unemployment was negligible. Eighty percent of the workers were labelled "central"; that is, they earned reasonable wages and had

stable jobs. Not surprisingly, 59.2% of the population had lived in the community less than five years, having moved from the nearby metropolitan area. A high degree of cooperative ownership meant that the majority of residents occupied private dwellings. The largest percentage of mobile homes in the province was concentrated in seven trailer courts within the community. This rapid development of concentrated housing to fulfill the demand for inexpensive accommodation had reduced individual privacy. Credit counselling was considered to be a health-related need as more and more residents incurred heavy debts.

Education

A community whose major energies are expended on law enforcement and economic concerns achieves a lower level of development than one whose energies are directed to education, social and cultural activities (Hanchett, 1979). Schools are responsible for promoting intellectual development and socialization of a community's youth into the community's values (Dever, 1980). Although school health facilities and personnel are important, quality lunch programs, gymnasias, extra-curricular activities, libraries, and counselling services may contribute to a student's physical, emotional and social health. These factors may be particularly significant at the high school level, when many teenagers make major decisions concerning lifestyle and face family pressures. Furthermore, adult literacy and continuing education programs can affect community development. Therefore, duration and quality of education of residents is significant information (Dever, 1980).

High school dropout rates, teenage pregnancies, vandalism, drug abuse, alcohol consumption, poor academic achievement and minimal parental involvement in the schools (less than half of the schools had parent-teacher associations) reflected individual and family health problems in this community. A moratorium on school construction as well as cutbacks in teaching staff were perceived as potential problems by the citizens. Adjunct services of resource teachers for the physically handicapped and mentally disabled were being developed, however, and clergy consultants and community volunteers were being sought. Some evening extension classes were conducted at the local high school. The majority of adult residents were English, originating from the British Isles, and had attained an educational level of Grade 11 or higher.

Law

The caseloads of a community's police force and lawyers often define the social health problems of its residents. Domestic quarrels, shoplifting, child abuse, vandalism, drug addiction, alcoholism and

other forms of adult and juvenile crime all indicate underlying problems and unhappiness. Community order, social organization and safety are indicated by family breakdown, crime and delinquency (Dever, 1980). Thus, the safety and security of a community's citizens must be considered and steps taken to overcome and prevent identified problems.

Fifty percent of the RCMP caseload concerned shoplifters, not serious offenders. The nearest police detachment was based in a neighboring town. No aid was available to people unable to finance legal counselling. Citizens of this community felt threatened by transients and juvenile delinquents. The juvenile delinquency problem indicated a need for community youth diversion programs; the majority of teenagers frequented shopping malls. Female residents were worried about the presence of a nearby minimum security correction center, although some volunteers visited the prisoners weekly for periods of sports and crafts. (According to Hanchett (1979), the flexibility of institutional boundaries is a major indication of health of a community system.)

Politics

Political jurisdictions identify the formal boundaries of many of the community's subsystems, such as school, health, and police districts. Furthermore, formal political channels can be the focus of legitimate authority (Poplin, 1979). Legislative or municipal hearings provide a medium to present issues concerning resource allocation. Thus the ability to control the direction of health dollar "energy" may lie with the politicians and not with the consumers (Hanchett, 1979). However, community development rarely occurs without participatory democracy (Roberts, 1979). Community political issues may focus on health concerns. The average election turnout can indicate the extent of citizen involvement and community cohesiveness. Political leaders and those involved in the formal and informal power base may be perceived as the most influential people in community activities. It is important, then, to identify the respective responsibilities of local and other governments for all other community subsystem services. Decision-making structures and organizations can include community councils, health and welfare councils, and housing authorities. The characteristic community patterns of decision-making and problem solving are more difficult to ascertain.

The site of sanitary landfill was a source of political conflict in the community studied. A community council was formed for two purposes: 1) to identify the needs of the area, and 2) to open avenues through which necessary resources could be provided for the community. A health committee of this local community council was a lobby for health-related services. Community politicians were trying to determine the focus of a proposed health center: whether it should maintain the quality of health in the community, restore individual health levels, or prevent health problems. Only two regional councillors represented the concerns of the community. This indicated that there was an urgent need for local government, and for the community to become incorporated as a town or city. The rapid growth of this municipally-governed community had surged ahead of its political evolution.

Recreation

A community's sports fields, playgrounds, arenas, camps, libraries, art galleries, museums, and theatres provide physical exercise, intellectual stimulation and an emotional outlet (Hanchett, 1979; Dever, 1980). The availability and location of inexpensive recreational services for all age groups should be assessed. The human energy directed to recreational activities can provide information about a community system's goals (Hanchett, 1979). It is also necessary to identify the participation levels in fitness-oriented groups; the use made of schools and vacant buildings for informal and formal recreational activities; and the existing number of family-centered programs.

In our study, we found that there were few developed playgrounds and sports fields, and that there was no pool. The one arena in the community was constantly in use. Free activities were rare. A recently-hired community recreational director, however, recognized the need for inexpensive fitness classes for housebound women and programs for senior citizens. A local recreation association was also trying to match recreational services and facilities with the rapid growth in housing. The county and community were reportedly reluctant to take responsibility for developing and maintaining playgrounds and parks. Residents met informally for recreation when more formal avenues were lacking or did not encompass individual preferences. Lack of leisure time can adversely affect mental health (Hanchett, 1979), but a large number of people who worked outside this community indicated that they did have minimal time available for social and recreational activities.

Religion

A traditional function of the church is to provide support to the individual and family in time of crisis. Religious associations focus on the spiritual health needs of the individual, regardless of age, sex, race, education or social class. Involvement in religious organizations can also help the individual develop spiritually and morally and cope with the shifting values of a technological era (Hrycak, 1980).

One of the unique services available in this community was a church program called *Family Clusters*. This program emphasized the growth of individuals within a Christian family, and so addressed the growing problem of family breakdown. While the community reflected the widely-recognized changing role of the church from social control to service, it had an unusual plan for a "church campus". Although it was purely an economic move, the campus concept involved cooperative sharing of facilities by six denominations and emphasized coordination of internal and community outreach efforts. This was a good example of system *synergy*, energy resulting from combined efforts from the member churches. There was a great potential for input by health workers in such a setting.

Social Life

While it is important to assess the predominant social classes, language, guiding values, child-rearing practices, racial and ethnic make-up of a community, its social committees, clubs and social organizations should not be ignored. These groups can promote cohesiveness and affiliation among citizens of all ages. Financial assistance, emotional support, psychological identification, counseling and rehabilitation of the handicapped are but a few of the services offered by social associations and clubs. Such groups may range from formal government agencies to informal primary friendship groups. Participation in community social activities can reflect social belonging (Dever, 1980). Socially isolated elements do not gain support from the community system and the system does not gain from their information and experience (Hanchett, 1979). Hence, internal exchange of energy and information is decreased. The percentage of people who belong to some established primary face-to-face group or are engaged in volunteer activities are indicators of community health. The community's culture and values affect its health and its ability to incorporate input from the environment. Community health requires that values adjust to changing needs yet retain sufficient stability to maintain system integrity and homeostasis (Hanchett, 1979).

The need for financial counselling, day care facilities and family-centered activities was predominant in this "instant" community, where separation and divorce rates were steadily increasing. Associations for the mentally retarded and for learning disabilities, as well as Alcoholics Anonymous, Parent Crisis, Senior Citizens, Kinsmen, Jaycees, Brownies and Cubs were only a few of the groups that were being developed to meet the community's social health needs. Neighborhood card clubs provided informal face-to-face contact for some residents.

EVALUATION

In this suburban community, the overlapping patterns of energy indicated that a network, or set of linkages, needed to be developed between the health subsystem and the other community subsystems to ensure dynamic interchange. The assessment of this community culminated in a proposal that a multi-service center be designed to coordinate the broad health services offered in the different subsystems: one that could meet the specific health and welfare needs of the community. (A community "need" results when a desired resource is not available from the environment, or when the community is unable to accept and assimilate the resource — Hanchett, 1979).

A multi-service center was possible, however, only if the participating subsystems or elements of these subsystems could agree on timing, location and goals of the center. Collaboration occurred; the proposal for a multi-service center was accepted and the center opened in 1981.

ADVANTAGES AND DISADVANTAGES

We found that this systematic approach had five distinct advantages:

1. It facilitated comprehensive assessment of the community's health related needs.

Community service priorities are invariably health-related, although they are not always recognized as such. A holistic approach to "human" services delivery can overcome this problem. A systematic assessment of client health needs promotes logical problem-solving and informed decision-making.

2. It helped coordinate and integrate prior research efforts.

Community studies and reports tend to be carried out in isolation, examining only one subsystem of the community. This inevitably causes fragmentation and duplication of reports.

3. It incorporated an epidemiological approach.

Community concerns are not always documented by statistical data. Figures from government and agency surveys can be extracted and summarized for the community's use.

4. It included input from citizens.

The major source of input in a community-focused study should be the community's residents. Their suggestions are crucial in assessing priority needs, planning relevant health-related services and developing new programs to meet these needs.

5. It promoted teamwork.

Integration of professional expertise is an important adjunct to citizen participation. Ongoing communication and collaboration among nurses, other health team members, and residents of the community throughout the assessment and planning phases can produce viable alternatives in community services. General systems theory is considered to be an interdisciplinary language of professionals and theoreticians alike.

The major disadvantage of this approach was the time it took to conduct the baseline study. The length of time varies with the size of the community involved and how familiar the nurse is with the community. It is apparent, however, that the benefits of systematic community assessment clearly outweigh the costs.

CONCLUSION

Many community studies that are carried out in isolation by external experts later gather dust on some professional's shelf. Surely a systematic approach to identifying priority community needs, one that involves the community itself, would help prevent such waste. Subsequent planning of comprehensive coordinated health-related services could then proceed in an organized fashion. The general systems theory approach to assessment which was used in this study proved extremely useful.

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RÉSUMÉ

Evaluation de la santé communautaire: approche systématique

On s'est servi de la théorie des systèmes généraux pour évaluer une collectivité en matière de santé et planifier les services appropriés. On a choisi pour ce faire une localité de banlieue dont la population s'était multipliée par six en moins de dix ans; or, l'évolution des services liés à la santé n'avait pas suivi le même rythme. Cette localité a été arbitrairement définie selon des lignes géopolitiques. Les sous-systèmes déterminés en vue de l'analyse comprenaient non seulement la santé mais également les communications, l'économie, l'instruction, le droit, la politique, les loisirs, la religion et les activités sociales. On a recueilli des données historiques et actuelles à partir de sources primaires et secondaires et on les a classifiées selon leurs influences positives ou négatives sur la santé. Cela a abouti à la proposition d'un centre à plusieurs services, conçu pour coordonner les services sanitaires offerts par les sous-systèmes. Le centre a ouvert ses portes en 1981. Cette approche systématique a facilité une évaluation complète et a permis de coordonner les efforts de recherche en incorporant les données épidémiologiques, en faisant participer les clients et en encourageant le travail en équipes interdisciplinaires.