

## EXTENSION OF HEALTH SERVICE COVERAGE IN PUNO, PERU<sup>1</sup>

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*A special program designed to expand health service coverage began some years ago in Peru's predominantly rural department of Puno. Preliminary results suggest it has considerably improved access to health services in that region.*

### Introduction

A special program for development and extension of health services was devised and implemented in order to improve the health conditions of the general population of the Peruvian Department of Puno and to strengthen the health sector's technical and administrative structure in the South Altiplano Health Region serving this department (1).

In accord with Peru's national health plan, the program's goals included the following:

1) to extend basic health service coverage to the population living in rural and marginal urban areas;

2) to provide comprehensive primary health care services in rural areas and to organize these so that they would provide effective access to the higher health service levels; and

3) to assign high priority to the execution of health activities in rural areas—especially to training personnel adapted to local conditions, creating appropriate health technology and infrastructure, and encouraging active community participation (2).

### The Setting

The Department of Puno, which includes the Peruvian portion of Lake Titicaca, covers an area of 72,382.5 km<sup>2</sup> and ranges in altitude

from 5,000 to 400 meters. The department is divided into three well-defined ecological areas: the lightly populated grazing and mining zone of the highland *puna* at an altitude of 5,000-4,000 meters; the heavily populated agricultural area around lakes Titicaca and Arapa beginning with the *altiplano* at an altitude of 4,000-3,800 meters and descending to 1,200 meters; and the jungle fringe at an altitude of 1,200-400 meters. The department's population was estimated at 925,127 inhabitants as of 1976, and the average population density was 12.8 inhabitants per km<sup>2</sup>.

The overall population was very young, 44 per cent of its members being below 15 years of age. Most residents (76.1 per cent) were living in rural areas; most confronted linguistic barriers relating to their indigenous Quechua and Aymara backgrounds; and most were living in small, highly dispersed settlements. Most (65 per cent) of the recognized population centers had fewer than 500 inhabitants.

With regard to sociocultural conditions, illiteracy in the rural and urban areas combined was estimated at around 66 per cent. In addition, there was a wealth of customs and beliefs that by and large had adverse health implications. The average per capita income fluctuated around 5,000 soles<sup>4</sup> per year, and incomes were even lower in subsistence farming communities.

### Health Conditions

In general, the level of health of this population was unsatisfactory. In 1975 the mortality rate was 9.8 deaths per 1,000 inhabitants, and

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<sup>4</sup>Equivalent to US\$55 at the time of the study.



**An *Altiplano* health center serving the Puno town of Pucará (altitude 3,800 meters). Photo by G. Mendizábal L.**



**Monitoring of child growth and development in Puno by a nurse trained in maternal and child care.**

the infant mortality rate was 101.1 deaths per 1,000 live births. Infant mortality accounted for 30 per cent of all deaths; mortality among children under 5 years of age accounted for 42.7 per cent of all deaths; and communicable diseases accounted for 55 per cent of all deaths. The maternal mortality rate was 8.7 deaths per 10,000 live births.

As reported by Torres (3), principal causes of death were diseases of the respiratory system (54.7 per cent); dysentery, gastroenteritis, and other diseases of the digestive tract (13.6 per cent); tuberculosis (5.6 per cent); whooping cough (2.6 per cent); and complications of pregnancy, delivery, and the puerperium (2.1 per cent).

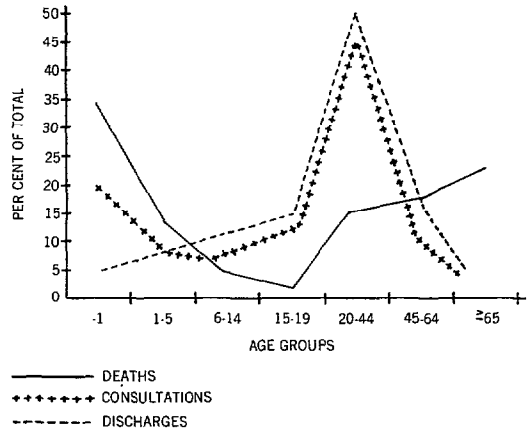
Environmental sanitation was inadequate. Only 13.9 per cent of the urban population and 0.6 per cent of the rural population had access to potable water, and sewers served only 15.6 per cent of the residents of the principal urban areas.

Medical manpower was scarce. There was one physician per 25,697 inhabitants and one nurse per 22,000 inhabitants. Moreover, there was a marked imbalance between the numbers of these scarce personnel serving urban areas and those serving rural zones. In general, the technical and human resources available were both badly distributed and poorly used.

If mortality among different age groups is compared with outpatient consultations and hospital discharges pertaining to those age groups, it can be seen that although children under 1 year old accounted for over 30 per cent of all deaths in 1975, and children between 1 and 5 years old accounted for over 10 per cent, most of the consultations and discharges pertained to people in other age groups where the number of deaths per year was far lower (see Figure 1). It is also true that much of the population really in need of services lacked access to such services and was living at a considerable distance from health facilities.

In 1975 the population that received physicians' care amounted to 10.6 per cent of the

Figure 1. A comparison of mortality, outpatient consultations, and hospital discharges in the South Altiplano Health Region, by age group, in 1975.



Source: Informe Estadístico de Mortalidad y Evaluación Operacional de Actividades, Región de Salud Sur Altiplánica, Puno, Perú, 1975

total population, and that provided with simplified care by health auxiliaries amounted to 15 per cent more, so that about 25.6 per cent of the population received medical care that year. Overall, the population that had access to health services provided by the formal health system at this time amounted to some 53.3 per cent of the total, leaving approximately 46.7 per cent of the total rural population without access to formal health services (4).

### Program Approach and Objectives

Strategies directed at those who should benefit from health improvements were devised by assigning priority to the least developed geographic areas, the most vulnerable human groups, and the most preventable health risks. These were respectively defined as follows: (1) rural and marginal zones that accounted for 76 per cent of the department's geographic area; (2) children under 15 years of age and pregnant women who together constituted 62 per cent of the population; and (3) communicable diseases, which accounted for

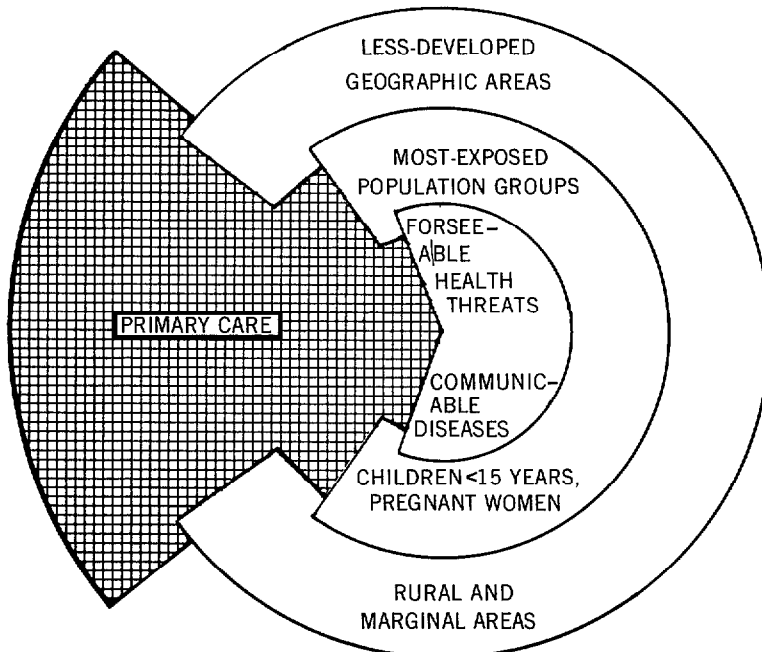
55 per cent of all morbidity and mortality in residents under 15 and pregnant women (Figure 2). These priorities were established with a view to fulfilling the World Health Organization's goal of providing basic health care for all members of society and overcoming the fact that some privileged people usually have access to complex health care while hardly any resources are left for the rest of the population (5).

The types of program assistance envisaged included the following: (a) provision of potable water by means of "water supply units" established within the scattered population; (b) prevention and control activities directed against the main communicable diseases endemic in the region; (c) provision of health care for mothers before, during, and after delivery; (d) monitoring of the development and growth of nursing infants, preschoolers, and school-age children; (e) provi-

sion of nutrition education and production of food by methods designed to make optimum use of available resources; (f) provision of basic health care for people with lesions or diseases in all age groups; and (g) the provision of easy-to-understand information that would create greater interest in health, demonstrate the importance of primary care to those responsible for delivering health services, and encourage active community participation (6).

Activities needed to attain these intermediate objectives were then defined in the following program areas: services to individuals (for control of communicable diseases, maternal and child health, food and nutrition, regular medical care, and simplified medical care); environmental services (for provision of safe water, basic sanitation, and urban refuse collection); development of infrastructure and support services (for strengthening of services,

Figure 2. Priority areas, population groups, and health threats targeted by the program for the South Altiplano Region.



education and training of human resources, and development of statistical information). Coordinated activities were also undertaken with the food, agriculture, and education sectors for the purposes of doing applied nutrition work, training volunteer personnel, and motivating the communities involved. To strengthen this coordination, a multisectoral working group was established under health sector leadership.

**Program Organization and Operation**

As work progressed, two organizational and operational stages of the program became clearly defined (see Annex). These included the planning and initial implementation stage (in 1976) and the program execution stage (in 1977-1978).

*Stage 1*

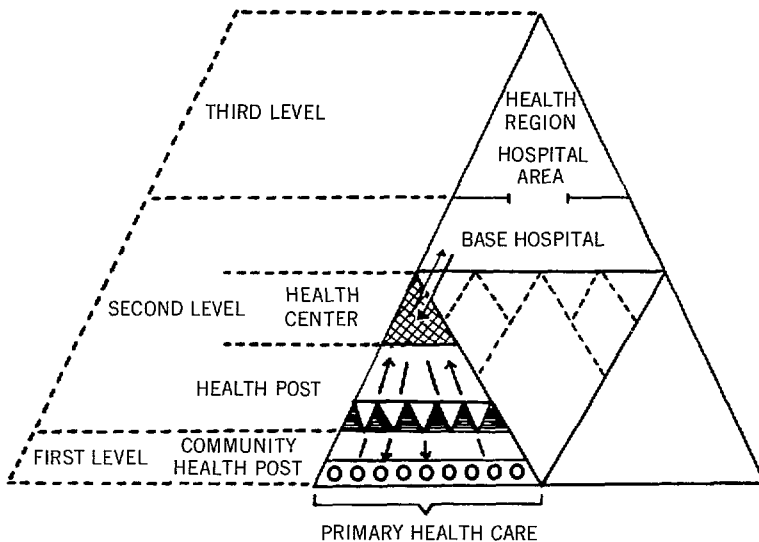
During the implementation stage, principal activities included training different categories of personnel, bringing about changes in in-

dividual and institutional attitudes, formulating a regional policy, strengthening the health infrastructure, and organizing the communities involved.

In line with the policy decision to begin the program at the first level—and thereby to provide access to the health service system at that level (7) while strengthening the system’s operating capacity—two initial actions were carried out. These consisted of an evaluation of the existing community health posts (at the first level) and a study of the affected communities’ current organization and degree of health service coverage. (Figure 3 shows the relationship between the primary care level, including the health posts and centers, and the first, second, and third levels of care as defined for the purposes of this program. As can be seen, primary care in the South Altiplano Region is provided at several levels.)

Concurrently, activities were undertaken to enlist active community participation. In some cases the community’s existing formal organization was used, while in others temporary commissions or committees were set up.

**Figure 3. The health services pyramid in the South Altiplano Region, showing the various levels (health center, health post, and community health post) providing primary care.**



Source: D. Flohault (8) Adapted to organizational plan in effect for services in Puno

Among the work performed to promote, orient, and regulate community participation, two particularly important activities at this first stage were taking a census of traditional midwives and selecting community leaders. These midwives and community leaders, identified as potential human resources, were to provide liaison between the traditional community and the institutional health service system, thereby giving access to the latter.

On the basis of earlier experience with training volunteer personnel in the region, a profile of the volunteer health auxiliary was prepared. An effort was then made to define functions relating to the principal harm that communicable diseases could do to individuals and families, as well as functions relating to needs perceived by the community. In addition, guides, manuals, and programs of instruction were prepared for training both traditional midwives and volunteer auxiliaries. Multidisciplinary groups established at the regional level and the level of the hospital areas (see Figure 3) were responsible for this training.

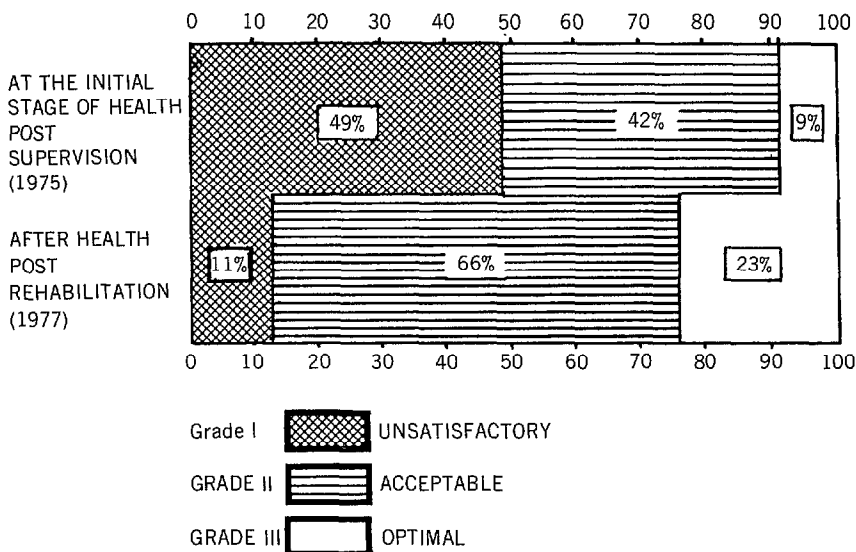
Stage 2

The second stage, beginning in 1977, had two phases. These were (1) rehabilitation of health services at the first level and (2) strengthening and orienting activities at the level of care provided by the health centers.

Provision of first-level care was improved through regular supervision during 1977. "Unsatisfactory" health post ratings were reduced from 49 to 11 per cent; "acceptable" ratings were raised from 42 to 66 per cent; and "optimal" ratings were raised from 9 to 23 per cent (see Figure 4).

In connection with this work, courses in health care delivery were used to train a group of nurse supervisors. These supervisors were then made responsible, under the direction of the hospital area and medical group authorities, for training health auxiliaries. All the health auxiliaries trained were instructed in primary care, community development and health care delivery, epidemiologic surveillance, and tuberculosis control. Nurses involved in the program received training in

Figure 4. Changes in the ratings of health posts in the South Altiplano Health Region, 1975-1977.



Source: Región de Salud Sur Altiplánica (5).

health service follow-up techniques and the programming and administration of health services.

Volunteer health auxiliaries and lay midwives received their training through health promotion efforts undertaken by health centers, health posts, and supervisory personnel in the interested communities.

A temporary supervisory group set up at the regional level was made responsible for carrying out and advising about courses for preparing volunteer personnel, as well as for evaluating program progress and the execution of activities at the primary level.

During the second phase (1978), the activities of the program were decentralized and were conducted within the jurisdictions of the hospital areas. The nurse supervisors were assigned to particular hospital areas and health centers, and were placed in charge of reorganizing the health centers (8). About 70 per cent of their time was devoted to supervising care at the primary level.

With regard to this health center reorganization, each nurse supervisor was assigned to a health center. There she worked with the chief medical officer, if there was one, or if not she worked alone. These nurse supervisors submitted reports to the headquarters of the hospital area concerned and to the regional directorate. Considerable efforts were made to train the nurse supervisors in simplified medical care and normal deliveries, so that they could effectively supervise and evaluate the work of volunteers.

## Results

It has not yet been possible to measure the program's impact in terms of such indicators as reduced mortality (especially infant and maternal mortality), increased immunity levels, and reduced communicable disease morbidity. Nevertheless, during the program's second year of execution periodic evaluations showed a number of encouraging results intimately related to development of the health infrastructure and personnel attitudes.

Specifically, in 1976-1977, 108 health posts were reorganized, equipped, and provided with appropriate operating standards. By the end of 1977 each of them had its own budget, and access to the health system was being expanded by 245 volunteer community health auxiliaries and 181 trained lay midwives.

In 1975 health care was being provided for only 25.6 per cent of a total population of 849,460, and far fewer people (10.6 per cent) were seen by a physician. However, physicians saw 13.1 per cent of the population in 1977 and 31 per cent of the total population received formal health care that year—an increase of 5.4 per cent in two years (4).

The 245 volunteer health auxiliaries—based in their communities, duly equipped, and active—were each responsible for an average of 500 inhabitants. They were supplying primary care services to 122,500 inhabitants, or 14 per cent of the population, thereby reducing the unserved population from 46.7 per cent (see p. ) to 32.7 per cent. All in all, organization of health care at this level has constituted the health system's first real step toward dynamic resolution of individual and community problems.

Subsidiary results of this process have provided the basis for a new dynamic policy of health care for rural communities, as well as a means of reducing the rigid centralization of resources in the hospital areas. Simplified health methods with a major impact on priority problems have been introduced—including differential epidemiologic surveillance, simultaneous vaccination of children under 2 years of age, a simplified program of tuberculosis control, local functional programming of activities, establishment of local laboratories, and simplified reporting.

Efforts to deal with the basic causes of health and disease have encouraged intersectoral coordination. At the regional level, a multisectoral working group has been established that includes representatives of the health, education, and food sectors; it is responsible for programming multisectoral activities at the National Institute of Planning.

At the local level, committees on which the same sectors are represented have been organized and are responsible for the supervision of services and community participation. In addition, coordination has been established with the School of Nursing of the National Technical University of the Altiplano by modifying the teaching curriculum to reflect the health problems prevailing in the South Altiplano Region.

In accord with the conceptual scheme of the South Altiplano program, it is expected that the program will ultimately provide volunteer health auxiliary coverage for 100 per cent of

the communities with fewer than 500 inhabitants. The program is also expected to provide training for 85 per cent of the traditional midwives in rural areas, to establish a referral flow from the access point (at the primary level) to the base hospital, to strengthen the health center care, to reorganize the base hospitals and the hospital areas, and, finally, to achieve a dynamic health organization at the regional level—in accord with technical, administrative, and epidemiologic criteria that will encourage thinking about major and already-proposed changes at the national level.

### SUMMARY

A special program was developed to improve the health service coverage provided in Peru's South Altiplano Health Region. The area involved (corresponding to the Department of Puno) encompasses 72,382.5 km<sup>2</sup> containing roughly 925,000 inhabitants, most of whom are poor and live in small, widely scattered rural settlements. In general, the population's level of health has been unsatisfactory.

The program developed for this region assigned priority to the least-served rural areas, to children and pregnant women within those areas, and to prevention of communicable diseases in these population groups. The plan envisaged provision of potable water, communicable disease prevention and control work, monitoring of infant and child growth and development, nutrition education, and health education demonstrating the importance of primary care and encouraging community participation.

To promote these activities, efforts were made to

strengthen health facilities at the primary care level and to train volunteer health auxiliaries, community leaders, and lay midwives who could provide residents with a point of entry into the health system. In addition, nurse supervisors capable of overseeing and reorganizing health center activities were trained; equipment was provided to health posts, health centers, and laboratories; and a wide range of planning, coordinating, and other activities were carried out.

Initial evaluations made in mid-1978 indicated that over a two-year period the program had considerably expanded health service coverage. A total of 108 health posts had been equipped and reorganized, and 245 volunteer community health auxiliaries and 181 trained lay midwives were providing improved access to the health system. Overall, it appears that the percentage of people with no access to health services in Puno Department fell from about 47 to 33 per cent.

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## ANNEX

### Principal activities undertaken to organize and operate the program.

Stage 1: Implementation (1976)	Stage 2: Execution (1977-1978)	
	First phase (1977)	Second phase (1978)
1) Organization of multidisciplinary groups responsible for programming, executing, and evaluating the program.	<p><i>General aim:</i> Rehabilitation (including technical and administrative strengthening) of the first care level (see Figure 3) and development of community articulation so as to provide access at the point of entry to the health system.</p> <p><i>General aim:</i> Reorganization and orientation of second-level primary care services (see Figure 3).</p>	
2) Arrival at policy decision to give priority attention to rural areas, health post and health center care, preparation of volunteer personnel, and the training of lay midwives.	<p>1) Formulation of local-level programs, within the framework of the programming unit (the health center and its area of influence).</p> <p>2) Orientation of the health center's activities with regard to program execution; establishment of supervisory arrangements at the primary level for volunteer health auxiliaries and trained lay midwives.</p>	
3) Assessment of the health infrastructure (degree of health post utilization) at the first level.	<p>3) Establishment of mechanisms for coordinating with other sectors, including (a) promotion of integrated programs with sectors having UNICEF support; (b) coordination of vaccination activities with agriculture authorities and the foot-and-mouth disease program; (c) coordination of personnel training with the departments of education, food, and health.</p> <p>4) Introduction of a surveillance system for monitoring nutritional status into maternal and child health activities.</p>	
4) Identification of critical areas (maternal and child health and nutrition, communicable disease control, basic sanitation, equipment, personnel training, and supervision).	<p>5) Periodic supervision of health posts by regional-level personnel and introduction of program activities into health post services.</p> <p>3) Periodic supervision from the regional to the health post level and introduction of the program's content into the services.</p>	
5) Activities undertaken in these critical areas: (a) preparation of local standards for maternal and child health (regional seminar); (b) determination of local operational standards for simultaneous vaccination, differential epidemiologic surveillance, tuberculosis control, and organization of a network of laboratories; (c) provision of equipment for 32 of the 64th health posts and two of the 10 health centers.	<p>4) Regular supervision of volunteer health auxiliaries and trained lay midwives.</p> <p>5) Initiation of a system of symptomatic epidemiologic surveillance at health posts in two hospital areas.</p> <p>6) Local programming, by health facility, of maternal and child health activities.</p> <p>7) Programming of tuberculosis control and simultaneous vaccination activities, by health facility.</p>	
6) Provision of personnel training: (a) adjustment of nursing training through modification of the curriculum of National Technical University of the Altiplano's academic nursing program; (b) training of health post auxiliaries in health service de-	<p>8) Training of 12 nursing auxiliaries in laboratory techniques at the health center level.</p> <p>9) Equipping of 14 health posts, 2 health centers, and 16 laboratories.</p>	

## ANNEX (cont.)

Stage 1: Implementation (1976)	Stage 2: Execution (1977-1978)	
	First phase (1977)	Second phase (1978)
<p>livery, symptomatic epidemiologic surveillance, and tuberculosis control; and (c) training of nursing personnel (three nurses) at the regional level in supervisory work.</p> <p>7) Systematic supervision of the primary care level by regional-level personnel.</p> <p>8) Preparation of programs, courses, and manuals for preparation of volunteer health auxiliaries and trained lay midwives.</p> <p>9) Training of 50 of the volunteer health auxiliaries.</p> <p>10) Training of 30 of the lay midwives.</p> <p>11) Formulation of the action plan for 1977-1978.</p>	<p>10) Teaching the first phase of a postgraduate course in community nursing to instructors at the National Technical University of the Altiplano and regional supervisory personnel.</p> <p>11) Supervision of the development of epidemiologic surveillance and tuberculosis control programs.</p> <p>12) In-service training of nursing personnel (eight nurses) in supervisory work.</p> <p>13) Regular supervision from the regional (hospital area) level of the second level of volunteer health auxiliaries.</p> <p>14) Review of standards, manuals, and evaluation sheets for volunteer health personnel and trained lay midwives.</p> <p>15) Training of 163 volunteer health auxiliaries.</p> <p>16) Training of 131 lay midwives.</p> <p>17) Formulation of an action plan for 1978, by multidisciplinary groups.</p>	<p>8) Training of sanitation technicians (seminar and programming workshop).</p> <p>9) Teaching the second phase of a postgraduate course in community nursing and preparation of the third phase.</p> <p>10) Partial evaluation of epidemiologic surveillance and tuberculosis control activities at the primary and secondary levels.</p> <p>11) Orientation of the nursing curriculum with regard to execution of activities at the health center level and health services administration.</p> <p>12) Assignment of nursing personnel to supervisory positions at the health center (program unit) level.</p> <p>13) Holding of periodic meetings of chiefs of hospital areas, chiefs of health centers, and supervisory personnel.</p> <p>14) Training of 31 volunteer health auxiliaries.</p>