

# HOSPITAL CARE IN PERU

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## SOURCE FOR HOSPITAL DATA

**U**NTIL recently, little quantitative knowledge on hospital care in Peru<sup>2</sup> has been available except for some statistics published annually by the Peruvian National Statistical Office. These statistics have been based on yearly report forms and generally have not included all hospitals. The individual hospital reports have been difficult to verify and the national statistics are published very late.

The first comprehensive data on hospital administration and general patient statistics appeared in 1958 with the publication of a "Medical and Hospital Survey in Peru" by the Medical School at the University of San Marcos. Soon after, a still more detailed statistical bulletin on Peruvian hospital statistics was published by the Interamerican Cooperative Public Health Service (SCISP). This official publication covered 1955 and 1956 and emphasized administrative and patient statistics. In November 1959, the Interamerican Cooperative Public Health Service in the Peruvian Ministry of Public Health released the second statistical bulletin covering 1957 and 1958.<sup>3</sup> Thus, considerable up-to-date detail is now known about general hospital care and facilities in Peru. This information and data are available for planning future facilities. The following is a general description of administrative aspects and patient

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<sup>2</sup> Peru is a Latin American country having over 11,000,000 population (1960) of which a large part is indigenous. The medical and preventive health facilities are largely concentrated in urban areas and the whole economy is classified as a "developing area."

<sup>3</sup> "Estadísticas Hospitalarias en el Perú, 1957-1958", (Lima: Servicio Cooperativo Interamericano de Salud Pública, Ministerio de Salud Pública, Informes Bioestadísticos # 2, Noviembre, 1959).

care of all hospitals in Peru for the year 1958 with some references to previous years and some provisional figures for 1959.

### GENERAL CHARACTERISTICS

Peru had in 1958 a total of 202 institutions classified as hospitals. For convenience, all institutions having beds available for hospital care were included and defined as hospitals.<sup>4</sup> These included mental institutions, leprosy colonies and medical posts having beds available for elementary type hospitalization. Although 202 hospitals were known to exist, subsequent statistics are based on 197 hospitals, since no information whatsoever was available for five hospitals.

Hospitals in Peru are administered by several different types of organizations. In addition to the hospitals administered by private and industry sources, the Social Security, Ministry of Public Health, the armed forces and a quasi-governmental public assistance agency, the "Beneficencia," all operate hospitals. These are mostly in urban areas, and the majority are in the metropolitan areas of Lima and Callao. However, each *Departamento* (state) has at least one hospital, and almost all provinces (subdivisions of departments) have at least one. A characteristic of this is a mal-distribution of hospitals and hospital beds among the population, with some areas having 2 or fewer beds per 10,000 population while others have as high as 150.

For statistical purposes, hospitals have been classified by the service or care rendered. Classifications include general, tuberculosis, maternity, cancer, mental and leper establishments. The great majority of the hospitals, 168 in number, are general treatment type. In addition, there are 5 tuberculosis hospitals, 9 hospitals specializing only in maternity cases, one cancer hospital, 6 mental institutions combining custodial and hospital-type care, 3 leper colony hospitals and 5 hospitals classified as other specialized hospitals.

<sup>4</sup> The definition of a hospital as an institution having 25 beds or more outlined by the American Hospital Association, was not used because of administrative and technical reasons peculiar to Peru.

TYPE OF HOSPITAL	No.	BEDS	DISCHARGES	PATIENT DAYS	AVERAGE DAILY OCCUPANCY	AVERAGE STAY (DAYS)	PER CENT OF OCCUPANCY
TOTAL 1958	197	21,912	269,700	5,989,451	16,410	22	75
1959	212	23,135	298,728	6,489,165	17,777	21	77
General 1958	168	17,150	226,994	4,337,127	11,883	19	69
1959	182	18,274	252,734	4,863,931	13,325	19	73
Special 1958	29	4,762	42,706	1,652,324	4,527	39	95
Service 1959	30	4,861	45,994	1,625,234	4,452	35	92

Table 1. General characteristics by type of hospital, Peru, 1958-1959. (1959 data are provisional).

A total of almost 270,000 new and return cases were discharged from all hospitals in Peru during 1958. Although the exact number of individual patients is not known, it is estimated that 250,000 persons received some hospital treatment at least once during the year. On this basis, about one out of every 50 persons in Peru was hospitalized sometime during that year. In large urban areas such as Lima and Callao, this proportion is much greater.

Monthly reports to the Biostatistics Program in the Inter-american Cooperative Health Service (SCISP) in 1959 indicated a total of 2,462 physicians working either part-time or full-time in hospitals.<sup>5</sup> From the same source, 2,000 professional nurses and 3,132 nurses' helpers were reported working in hospitals.<sup>6</sup> The use of midwives in hospitals is very common; 394 were reported as working full time. Undoubtedly, many others work part time in these hospitals.

Because the functional and administration aspects are quite different, statistical tabulations were made separately for general hospitals and special treatment hospitals. Table 1 gives data related to various administrative aspects of their services.

<sup>5</sup> As is the custom in Peru, the great majority of the physicians reported employed by hospitals are part-time physicians. Somewhat over 60 per cent of all physicians working in hospitals during 1959 have been tentatively classified as employed part-time or ad-honorem. (See section on hospital personnel.)

<sup>6</sup> Nurses' aids as classified here include for the most part non-professional nurses' helpers. An unknown number are semi-professional nurses' aids who usually have received a short training.

Some general observations may be made from Table 1. The average length of stay per patient is much greater for special service than for general hospitals. The number of discharged patients<sup>7</sup> in special hospitals is about 16 per cent of the total but the number of patient days amounts to almost 28 per cent. The percentage of occupancy is considerably higher for special hospitals. As would be expected, mental and tuberculosis hospitals, and institutions for treating leprosy tend to increase the average patient stay.

A definite trend in Peru is an increasing number of births and a decreasing number of deaths occurring in hospitals. In 1958, there were almost 62,000 births in hospitals and 10,260 deaths. In comparison, there were 50,000 births and 11,000 deaths in hospitals in 1955. However, the proportion of discharges for childbirth in relation to total discharges has increased only slightly. The hospital death rate has decreased considerably.

Considerable information is available about patients treated in hospitals. During 1958, the hospitals in Lima had nearly 110,000 discharged patients. The majority lived in Lima or so stated their residence. However, almost 10,000 patients came from all other Departments (states) in Peru with the greatest number coming from the Department of Ancash (1780). The major causes of hospitalization vary from area to area in Peru. For example, the major hospitalization cause for residents of the Department of Ancash was tuberculosis while for residents of the Department of Junin, it was malaria. In the case of Ancash, the estimated rate is high probably because of the creation of a new industrial area in Chimbote. In general, tuberculosis, childbirth, miscarriage and related conditions, and accidents were the most prominent causes of hospitalization in Peru.

Because hospitalization for childbirth and its complications was included, many more females were hospitalized than males.

<sup>7</sup> Discharged patients are for all practical purposes synonymous with hospital cases.

If the number of women hospitalized for childbirth and its complications is subtracted from the total hospitalized, male rates for hospitalization are much greater. The greatest number of hospitalizations occurred in the 20-24 year age group.

Since census statistics are not currently available by occupation, it is not possible to compute differential hospitalization rates by occupation. In terms of absolute figures, agricultural workers and service workers were the most frequently hospitalized. Over 50 per cent of all persons hospitalized were persons not in the labor force, such as children and housewives.

### SOME HISTORICAL CONSIDERATIONS

There appear to be few historical statistics and data on general hospital care in Peru. However, from some fragmentary data available, it is obvious that hospital facilities have increased tremendously since 1942. Although it cannot be proven with absolute certainty because of the scarcity of reliable data, it would seem that the facilities have increased somewhat faster than the general population growth during the sixteen years between 1942 and 1958.

This conclusion is supported by various data. The population in 1942 was estimated at about 7,250,000 and between 10,000,000 and 11,000,000 in 1958. This produces about a 50 per cent increase in population, which is considered a minimum increase. However, the number of patient days during this period increased more than 100 per cent, from 2,800,000 to 6,000,000 in 1958. Also, in terms of numbers of hospitals, there has been an increase of slightly over 100 per cent, although the number of available beds has increased slightly less than 50 per cent. The number of hospitals has increased but the number of beds has not increased in proportion.

A greater percentage of the population in Peru is now using hospital facilities than 16 years ago. Although the population has increased by a roughly estimated 50 per cent, the number of patients has increased from 148,500 in 1942 to 270,000 in 1958, a percentage increase of about 80 per cent. The average

length of stay per patient has remained constant, i.e., 19 days. However, from provisional tabulations of 1959 statistics, a declining trend is noted. (See Table 1)

The proportion of all available hospital beds in Peru operated by the Beneficencia Publica in 1942 was 78 per cent. In contrast, this figure dropped to about 50 per cent of the total in 1958. The number of beds operated by the Beneficencia increased from 9,487 to 10,026 during the sixteen year period.

Greatly increased facilities in terms of hospital beds have been provided by the Ministry of Public Health with almost a four-fold increase; by the social security hospitals with almost 3 times the number of beds; and by private hospitals with almost 7 times the number maintained in 1942. The armed forces hospitals were not reported in 1942.

In all general hospitals in 1958, 4.9 per cent of all patients were discharged by reason of death. This is compared with a hospital mortality rate of 6.6 per cent in 1942.<sup>8</sup> It is evident from figures in Table 2 that Peru is making definite progress in the extension of hospital facilities for its population. This is demonstrated by such indices as increased bed capacity, number of hospitals, total number of patients and total number of patient days. However, as will be pointed out in later sections,

Table 2. Hospital characteristics by selected indices, Peru, 1942, 1958.

ADMINISTRATIVE DIRECTION	No. OF HOSPITALS		No. OF BEDS		AVERAGE LENGTH OF STAY		TOTAL PATIENT DAYS		No. OF PATIENTS	
	1942	1958	1942	1958	1942	1958	1942	1958	1942	1958
Beneficencia Pública	64	66	9,487	10,026	} 19	} 19*	} 2,821,823	} 5,989,451	} 148,466	} 269,700
Ministry of Public Health	8	31	1,276	4,577						
Social Security	3	13	902	2,546						
Private and Industrial	14	83	457	3,277						
Armed Forces	—	4	—	1,486						

\* General Hospitals only.

<sup>8</sup> Teodoro S. Cleveland, Factores que Determinan las Condiciones en los Hospitales del Perú, (Factors that Determine Hospital Conditions in Peru). *La Reforma Médica*, xxi, 461, (October, 1945.) (Reprint from *Hospital Progress*, [February, 1945]).

even greater facilities need to be provided if completely adequate hospital care is to be available to all needing it.

#### HOSPITAL ADMINISTRATIVE ASPECTS

1. *Capacity by Selected Attributes.* From data available for 1958 the greatest number of hospitals was included in an arbitrary bed-number classification of 25-49 beds. This included 45 hospitals out of a total of 197. Among the larger hospitals, 7 had 200-299 beds, 9 had 300-499 and 9 had 500 beds or more. The tendency in Peru is to emphasize the construction of hospitals with greater numbers of beds.

The greatest number of general hospitals also falls in the 25-49 bed classification. Among specialized hospitals, the five hospitals for tuberculosis included two with 300-499 beds and one in the group 500 and more. Of the nine maternity hospitals, most are small with the exception of one in Lima which has almost 500 beds. The only specialized cancer hospital has 120 beds. The hospitals classified as mental for the most part have a small bed capacity with the exception of one in Lima which reported 1,000 beds.<sup>9</sup> Among the three leper hospitals reported, two are small and one reported a capacity of over 500 beds. The latter is a combination hospital and leper colony.

Of the 66 hospitals operated by the Beneficencia, 36 per cent or a total of 24 had a capacity of 49 beds or less, compared with 70 per cent of those operated by the Ministry of Public Health. In general, the Beneficencia operates the greatest number of large capacity hospitals. Although small in number (4 hospitals), the armed forces including the police force, maintain three large general hospitals of which one had more than 500 beds. The private hospitals are for the most part small general hospitals. Of 41 hospitals classified as private, five were listed as having between 100-199 beds. Generally, hospitals classified as industrial were also small with the exception of 4 which had between 100-199 beds.

In terms of numbers of general hospitals, the Beneficencia in 1958 operated the greatest number (66), an increase of one

<sup>9</sup> This hospital is a treatment-custodial type.

hospital over 1957. This chain of hospitals also maintained the greatest number of beds (8,001). Although the number of general hospitals operated by the Social Security was only 13 in 1958, the number of beds maintained (2,546) was greater than those of the Ministry of Public Health (2,330) in its 22 hospitals.<sup>10</sup> The beds available in all Peru increased from 14,979 in 1957 to 17,150 in 1958.<sup>11</sup>

As would be expected, the capacity of general hospitals in Peru is generally proportional to the size of the urban population. Almost all hospitals are located in urban areas with the largest urban areas having the most facilities. A few provinces which are predominantly rural have no hospital facilities whatsoever. However, it is interesting to note that some medium-sized urban areas such as Tacna near the Chilean border and Pisco on the Peruvian coast have more bed capacity in terms of population size than really large urban population concentrations such as Lima, Callao and Arequipa. On the other hand, some medium-sized urban areas such as Huaraz, Huancavelica, Huancayo, all in the mountainous Sierra, have comparatively small hospital bed facilities. One of the most neglected areas is the Province of Puno (near the Bolivian border) with a population of almost 250,000 and only 300 general hospital beds available.

General hospitals having a capacity of 500 beds or more are limited to the Departments of Arequipa and Lima, both areas of high urban concentration. Specialized hospitals such as tuberculosis, cancer and maternity are located almost entirely in the Province and the metropolitan area of Lima with the exception of maternity hospitals in the Department of Ica, Junin and Callao. Tuberculosis hospitals are located in Lima, La Libertad and Junin.

Ideally or normally, hospitals with small numbers of beds

<sup>10</sup> The number of beds listed for the Social Security hospitals does not include the new Employees' Hospital which started to function during the final months of 1958. This hospital maintains 1000 beds.

<sup>11</sup> An unknown percentage of this increase was probably due to improved reporting in 1958.



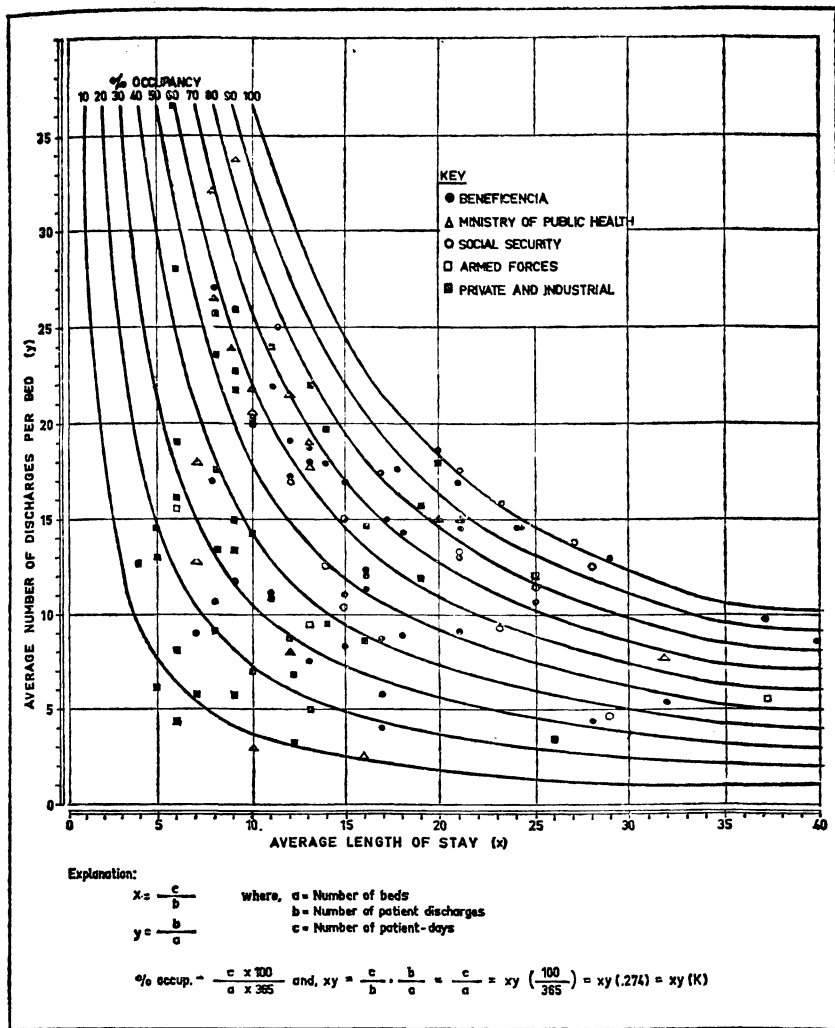


Fig. I. Percentage of occupancy for hospitals classified by average length of stay and average number of discharges per bed (general hospitals with 25 beds and over). Peru: 1958.

should have comparatively few patient discharges and large capacity hospitals should have a great many patient discharges. However, in Peru, there is considerable variation in this respect even though some special care hospitals with large capacity and few discharges are excluded.<sup>12</sup> For example, 8 hos-

<sup>12</sup>This variation, although not statistically calculated, is a crude measure of comparative general occupancy indices and use efficiency. See Fig. I.

pitals in the 25-49 bed capacity classification had less than 99 patient discharges in 1958. Two hospitals in the 50-99 bed group reported less than 200 patient discharges and one in the 300-499 bed group also reported less than 200 discharges.

On the other hand, one hospital with nine beds reported patient discharges in the 300-499 classification and one hospital in the 100-199 bed classification reported more than 5,000 patient discharges. Four hospitals with the same bed capacity classification, i.e., 100-199, reported 2,500-4,999 patient discharges in 1958.

2. *Patient Discharges and Patient Days.* Some mention has been made about patient discharges in relation to bed capacity. This section discusses various other aspects of discharges and patient day patterns.

Slightly over 15 per cent of all hospitals had less than 100 patient discharges per year. This has been generally true since 1955. Almost 50 per cent of all hospitals in Peru had less than 500 patient discharges per year. Ten hospitals had 5,000 or more patient discharges each and nine of these had a capacity of more than 300 beds. These figures suggest a pattern of many relatively small hospitals with a small number of monthly admittances and discharges and few very large hospitals (5 per cent of all hospitals) with a relatively great monthly discharge rate.

In 1958, statistics were recorded on 168 hospitals classified as general hospitals out of a total of 197 reporting units. Of these 168, 22 had less than 99 patient discharges during the year and 60 per cent of all general hospitals had less than 1,000 patient discharges each. At the other extreme, 12 per cent had 2,500 or more discharges. The only cancer hospital in Peru having a capacity of 120 beds had 1,873 discharges in 1958 and the largest tuberculosis hospital with 966 beds had a total of 927 discharges. The largest maternity hospital with 460 beds had 28,605 discharges.

The Beneficencia had administrative direction for 66 hospitals, of which 61 are classified as general, one as tuberculosis,

three as maternity and one as a combination mental-custodial hospital. In terms of patient discharges, the general hospitals range in size from 6 hospitals with fewer than 100 discharges each to 6 hospitals with 5,000 or more discharges per year. The mental institution, although classified as a 1,000 bed hospital, had fewer than 300 discharges in 1958. Of the three maternity hospitals, each of the two largest had over 5,000 patient discharges.

The 13 Social Security hospitals are comparatively large general-type hospitals. None had fewer than 500 patient discharges per year and ranged up to 5,000 and more. Seven had between 1,500 and 2,499 discharges. Of 22 general hospitals operated by the Ministry of Public Health about one-third had fewer than 500 patient discharges per year. One general hospital had over 5,000, and the others ranged from 500 to 4,999 discharges per year.

Privately operated hospitals (41) include 26 classified as general. Of these almost 80 per cent had fewer than 1,000 discharges per year with 30 per cent having fewer than 300 pa-

Table 3. Number of hospitals by patient discharge groupings, hospital direction and type of service, Peru, 1958.

TYPE OF SERVICE AND HOSPITAL DIRECTION	TOTAL	NUMBER OF PATIENT DISCHARGES DURING YEAR								
		0- 99	100- 199	200- 299	300- 499	500- 999	1000- 1499	1500- 2499	2500- 4999	5000 and Over
<b>TOTAL</b>	197	33	20	18	21	36	19	27	13	10
General	168	22	15	12	20	34	18	26	13	8
Tuberculosis	5	2	1	—	1	1	—	—	—	—
Maternity	9	4	—	1	—	1	1	—	—	2
Cancer	1	—	—	—	—	—	—	1	—	—
Mental	6	3	1	2	—	—	—	—	—	—
Leprosorium	3	2	1	—	—	—	—	—	—	—
Other	5	—	2	3	—	—	—	—	—	—
Beneficencia	66	7	5	5	8	11	9	9	4	8
Ministry of Public Health	31	6	3	2	2	7	4	4	2	1
Social Security	13	—	—	—	—	2	1	7	2	1
Armed Forces	4	—	—	—	—	1	—	—	3	—
Industry	42	12	4	5	6	7	3	4	1	—
Private	41	8	8	6	5	8	2	3	1	—

tient discharges each. All industrial hospitals are classified as general and the patient discharge pattern is very similar to other privately owned hospitals. Table 3 summarizes the data presented above.

The hospitals with high numbers of patient discharges are located in populous areas such as Lima, Arequipa, Callao. An exception is Tacna which has a comparatively small population but had a relatively high patient discharge rate in 1958. In part, this high rate was due to patients erroneously giving their permanent address as Tacna in order to gain admittance.

An important index of hospital capacity and its relation to hospital use and efficiency is patient days. "Patient days" refers to the total number of days of hospital care for any patient. The relation between patient days and the number of effective beds produces a general index of occupation during a given period of time. The average length of patient stay can also be computed from patient days. All of these indices are important for measuring effective hospital administration. These indices for various types and classes of hospitals are discussed later in more detail.

In 1958, all general hospitals had a total of 4,337,127 patient days with those under the direction of the Beneficencia making up slightly over 53 per cent (2,310,539) of the total. The Beneficencia general hospitals included 46 per cent of the total hospital discharges which, of course, indicates a comparatively longer period of hospitalization per patient in their hospitals than average. Hospitals operated by the Ministry of Public Health and Social Assistance made up slightly over 11 per cent of the total patient days; armed forces hospitals almost 7 per cent, Social Security hospitals 18 per cent and industrial and privately directed hospitals 11 per cent. It is noted that the Social Security hospitals had 15 per cent of the total patient discharges for general hospitals and 18 per cent of the total patient days while the Ministry of Public Health hospitals had 14 per cent of the total number of patient discharges with only 11 per cent of the total patient days.

Out of a total of almost 6,000,000 patient days for discharged patients reported from all Peruvian hospitals, 28 per cent was reported from special type hospitals in 1958. The number of patients comprised 16 per cent of the total discharged from all hospitals.

The five tuberculosis hospitals carried the greatest patient day load with 37 per cent of the total patient days for special hospitals. The total patient days for these hospitals with 1,791 beds exceeded considerably the total number of patient days of all 22 general hospitals with 2,330 beds which are under the direction of the Ministry of Public Health.

The nine maternity hospitals in Peru with a total of 790 beds had over 37,000 patient discharges in 1958, but, because of the comparatively short average stay of each patient, the number of patient days was slightly under 250,000.

Although cancer is estimated as the third major cause of death in urban Lima, only 120 beds are available for its care in the only special cancer hospital in Peru and only 37,750 patient days for 1,873 patient discharges were reported for 1958. One half of all patients hospitalized for cancer were hospitalized in general hospitals instead of the special cancer hospital. Of all patients discharged and diagnosed as cancer, 54 per cent reported their residence as Lima or Callao (population, 1,450,000) and 46 per cent were from all other areas in Peru (population 8,550,000).<sup>13</sup>

3. *Average Daily Attendance And Length of Stay.* Average daily attendance in all hospitals for 1958 was 16,410 patients. This was an increase of almost 9 per cent over the previous year. General, as distinguished from special hospitals, accounted for almost 12,000 of this total. In other words, at any given time, it would be expected that about 16,500 individuals would be hospitalized or about .15 per cent of the total popu-

<sup>13</sup> It is interesting to note that the specialized cancer hospital (Instituto Nacional de Enfermedades Neoplásicas) in Peru had almost exactly one half the total number of patient-discharges for cancer but only 32 per cent of the total patient days. Obviously, the average patient length of stay for cancer was considerably greater in hospitals other than the cancer hospital.

lation of Peru. For urban Lima .3 per cent of the total population would be hospitalized at any point in time.

The Beneficencia hospitals made up over 50 per cent of the total average daily attendance for all general hospitals and the Social Security hospitals made up almost 20 per cent. The average daily attendance during 1958 in all 5 tuberculosis hospitals in Peru was 1,700, an increase of 21 per cent over 1957. This was because a greater percentage of the available beds were made use of in 1958. In the six mental hospitals the total average daily attendance was 1,338. The largest mental hospital reported 1,000 beds for an average daily attendance of 1,204 patients.

The average length of stay per patient in 1958 in all general hospitals was 19 days compared with 39 days for special hospitals. Among the general hospitals, there was considerable variation in the average length of stay. Private general hospitals had the shortest average stay (10 days) while the four armed forces hospitals had the longest (26 days). The largest armed forces general hospital with 860 beds had an average length of stay per patient of 37 days. It is interesting to note, that, with few exceptions, the average length of stay per hospital increased with the number of available beds. The average length of stay for general hospitals operated by public or semi-public funds is over twice as great as for those operated by private funds.

The average length of stay in the five tuberculosis hospitals was 436 days for patients discharged in 1958, even though modern tuberculosis treatment calls for less hospitalization time and more home treatment. However, in the largest and most modern Peruvian tuberculosis hospital (Bravo Chico), the length of stay was slightly over 365 days. The comparatively long stay in Peruvian hospitals for tuberculosis patients may be due to the great numbers with advanced disease and also to the poor facilities for home treatment. Both factors would preclude an early discharge for many patients. One possible reason the average length of stay for Bravo Chico was

shorter is because other hospitals sent patients there only for surgery.

Little variability is shown in the length of stay for patients in all nine maternity hospitals. The average was 6 days in 1958, with a range of from 5-7 days. For patients in the National Institute of Cancer (cancer hospital) the average stay was 20 days in 1958 compared with 17 days in 1957.

Some special comments and interpretation must be made for the six hospitals classified as mental. These hospitals had a total of 1,202 beds and included one hospital with 1,000 beds. The other five were private treatment hospitals and did not provide long-term custodial treatment except for a very limited number of patients. The average length of stay was about five months for this group. However, the only treatment-custodial type hospital in Peru indicated a much different pattern precisely because it is a combination type hospital. Even though 440,000 patient days were recorded for this 1,000 bed hospital, there were only 265 discharges so defined. The average length of stay for this group was over 4½ years.<sup>14</sup>

A somewhat similar situation exists in Peru's largest leper hospital. This hospital is a leper-colony type and reports, as does the largest mental hospital, an average daily attendance that is greater than the number of the available beds. Only 206 patients were discharged in 1958 and their average length of stay was over 3 years. ( See note 14)

<sup>14</sup> Some difficulty was encountered in defining a patient discharge from this hospital. At present, it is rather loosely defined as a patient who is discharged completely and without expectation of return. Two-week or three-month trial periods are not ordinarily defined as discharge unless a patient fails to return. Even then, sometimes he is not listed as discharged for a long period of time. The statistics that are reported from this hospital and subsequent conclusions must be regarded as estimates. Another difficulty in hospitals such as mental and leprosy is the computation of average length of stay based only on discharges. Unlike hospitals with many discharges during a year, these hospitals have relatively few. In order to compute exact length of stay for patients discharged, information must be available as to the number of patient days for each discharged patient. The sum of these patient days divided by the number of discharges gives the average patient stay. Unfortunately, the number of patient days for each patient is not readily available and exact average length of stay cannot be computed exactly for hospitals such as mental-custodial and leprosy. This problem is minimized in almost all other hospitals because few patients stay longer than one year and therefore almost all patients admitted contributed patient days and were released during a year's time.

4. *Percentage of Occupancy.* A very important administrative index is the percentage of occupancy of a hospital during a given period of time. In some respects, it is an index of general administrative efficiency and, above all, indicates the extent to which the capacity of the hospital is being used for the purpose for which it exists.

The extreme variation in the percentage of occupancy among the hospitals stands out as one of the principal administrative features of hospital care in Peru. Even without detailed observation, it can be concluded that hospital care could be extended considerably with the present number of hospitals providing that they were used in greater proportion to their bed capacity. At least, this is an observation which warrants further serious study.<sup>15</sup> This is especially significant in view of present (1961) plans to construct more hospitals. In view of the discussion to follow it would seem logical to investigate the possibility of increasing facilities and making necessary adjustments in order to make better use of the hospitals presently available.

In terms of occupancy, another significant feature is the low occupancy rates which are generally confined to the smaller general hospitals. This is true even though the smallest classification of 1-9 beds is removed. In other words, the fewer the beds in a hospital the lower the percentage of occupancy; the greater the number of beds, the greater percentage of occupancy. This positive correlation between number of hospital beds and rate of occupancy holds true quite generally for general hospitals administered by whatever group. The overall occupancy rate for general hospitals was 69 per cent. General hospitals operated by the Social Security system had the highest overall

<sup>15</sup> Any further study of this observation would necessarily need to consider why so many hospitals in Peru are operating at 50 per cent bed capacity. This includes, in some cases large, well situated hospitals. Some reasons why hospitals cannot extend their services and occupy more beds may well be insufficient equipment other than beds, poor laboratory facilities, insufficient available personnel, insufficient funds to operate at full-capacity, too many facilities for special classes of persons such as military personnel whose sickness rate is insufficient to occupy all available beds, inefficient and wasteful management, public apathy to poor facilities and a host of other possible explanations.



rate (85 per cent in 1958), and 26 private hospitals (excluding industry-operated hospitals) with a total of 1,150 beds had the lowest occupancy rate, (44 per cent). The armed forces with their 1,500 beds had an occupancy rate of 56 per cent; the Ministry of Public Health, which maintained 2,330 beds, had a comparatively low rate also, 58 per cent. It is quite significant that in view of the large number of hospitals and the large number of beds (8,000) the Beneficencia hospitals maintained a comparatively high occupancy percentage (79 per cent) in comparison to other administrative groups.

In contrast to the relatively low percentage of occupancy for general hospitals in Peru, the special treatment hospitals maintained high rates. The rate for all special hospitals was 95 per cent in 1958 and 92 per cent in 1959. As with general hospitals, there is a positive correlation between the number of hospital beds and the rate of occupancy. Almost all special hospitals with 50 beds or over had at least 75 per cent occupancy and three hospitals with a combined total of 2,576 beds exceeded 100 per cent occupancy.<sup>16</sup>

Since tuberculosis is a serious debilitating illness and cause of death in Peru, it is not surprising to find that all five tuberculosis hospitals in Peru had an average occupancy rate of 95 per cent in 1958. The largest hospital, (Bravo Chico) with almost 1,000 available beds had an occupancy rate of 99 per cent in 1957 and 98 per cent in 1958.

Maternity hospitals had an occupancy rate of 74 per cent with the largest (over 500 beds) reporting 92 per cent. The only cancer hospital reported 86 per cent, the 6 mental hospitals reported 111 per cent. The latter group reported more patients than available beds.

When percentage of occupancy for general hospitals is classified by hospital facilities located within the political boundaries

<sup>16</sup> This condition exists because two of these hospitals reported a daily average attendance somewhat in excess of the reported number of beds. One of these was a mental-custodial type hospital which apparently does not have sufficient beds for the custodial type patients. The other was a leper hospital-colony which reports colony patients not occupying beds in addition to advanced cases which actually occupy all beds reported as available.

of provinces, a great deal of variation exists. In some cases, where hospital facilities are smallest, the facilities that are available are actually used the least. Expressed another way, the percentage of occupancy is low in existing hospital facilities in some provinces where the ratio of available beds to population is also low. For a variety of reasons, including poor existing facilities in the available hospitals, the facilities are not used to capacity. This is apparently true in the provinces of Huaraz (58 per cent), San Román (67 per cent), Cañete (66 per cent), Pasco (58 per cent) and many others. On the other hand, some provinces such as Lima, Arequipa, Callao, Pisco, Puno and others seem to use to a much greater extent the facilities that are available.

5. *Estimated Population Rates.* No current census figures are available for Peru. The last census was taken in 1940 and it is believed that both size and age distribution has changed considerably. However, population estimates have been computed using vital statistics and corrections for omission as indirect indices of population size. The estimates were calculated for each province having at least one general hospital. The total population in those provinces was calculated as 6,560,000 in 1958. This population estimate represents roughly that population which either has easy or some limited access to hospital facilities.<sup>17</sup> It does not include whole provinces which do not have at least one general hospital. For this estimated population, various rates have been calculated.

For this population as a whole, there were 26 available hospital beds per 10,000 population. The rate varied considerably from province to province, the Province of Tacna on the southern-most border with Chile having 152 beds and some provinces

<sup>17</sup> The total population of Peru in the same year was estimated at slightly over 10,000,000. It cannot be inferred, however, that only two-thirds of the population are covered by hospital facilities because the population desiring hospitalization in those provinces without facilities (and not included in the figure of 6,560,000) can obtain it by traveling to a province in which facilities are available. There is statistical evidence to indicate that many people do travel to hospitals in provinces other than those in which they live. It is probable that many others are denied hospital facilities because none are available and they are unable to travel to distant areas where facilities do exist.

in the mountainous area having one bed or fewer per 10,000 inhabitants. Highly urbanized provinces such as Lima, Arequipa and Callao had 39, 45 and 44 respectively. The heart of the former Inca empire, Cuzco, had 58 which is somewhat higher than Peru's principal city, Lima.<sup>18</sup>

It is interesting to note that the comparatively small mountain province of Yauli (population 55,100) with its seven hospitals and 426 beds, had 77 available beds per 10,000 population. As was previously pointed out, some provinces with a comparatively low ratio of beds to population also have paradoxically low rates of occupancy. For example, in the province of Jaen (Department of Cajamarca) there were only 3 beds per 10,000 population, and the percentage of occupancy was 44. Another example is the province of Huancayo (estimated population: 183,000) with 4 general hospitals and 344 beds. This province had but 19 beds per 10,000 inhabitants and an average percentage of occupancy of 36 (1958). It can be concluded that the number of beds per given unit of population is merely one index of facilities. Of greater importance is whether these facilities are used.

Facilities may also be measured in terms of patient discharges. Here again, the rates show great variation. Generally, those areas having high rates of patient discharges also have comparatively high rates of average occupancy. The overall rate was 346 patient discharges per 10,000 population in 1958.

Out of a total of 227,000 general hospital patients in 1958, 1,000 were discharged by reason of death, giving a death rate of 1.7 per 1,000 general population. If it is accepted that the general crude death rate in the total population of Peru varies from 9.5 to 17 depending on the locality, it follows that a comparatively small percentage of deaths occur in hospitals. Death rates among hospital patients vary from province to province. Generally, as would be expected, those provinces having more hospital facilities have higher death rates among patients in

<sup>18</sup> Since 1958, a large 1000 bed Social Security hospital for white-collared workers (empleados) has been constructed in Lima and partially put into operation. This hospital is not included in the above figures.

HOSPITAL DIRECTION AND BED GROUPS	HOSPITALS			BEDS			PATIENT-DAYS		
	1957	1958	1959	1957	1958	1959 <sup>2</sup>	1957	1958	1959
<b>TOTAL</b>	161	168	182	14,979	17,150	18,408	3,986,961	4,337,127	4,863,5
1-9	10	13	16	57	84	106	7,716	8,097	10,8
10-24	42	33	46	634	543	808	113,838	69,663	85,6
25-49	32	39	37	1,077	1,309	1,250	186,552	196,576	202,1
50-99	32	32	30	2,209	2,135	2,048	468,197	400,907	368,0
100-199	29	32	34	4,044	4,424	4,806	938,561	1,088,193	1,164,6
200-299	5	7	5	1,272	1,816	1,330	399,855	519,445	409,3
300-499	7	6	8	2,636	2,378	3,370	811,498	606,572	894,0
500 and Over	4	6	6	3,050	4,461	4,690	1,060,744	1,447,674	1,728,9
Beneficencia	60	61	65	7,756	8,001	8,142	2,138,834	2,310,539	2,553,1
Ministry of Public Health	20	22	23	1,679	2,330	2,317	473,533	492,993	520,5
Social Security	11	13	14	2,119	2,546	3,283	655,087	786,719	1,000,6
Armed Forces	4	4	5	1,061	1,486	1,707	260,327	301,089	325,1
Industrial	40	42	46	1,444	1,636	1,672	270,474	261,528	264,6
Private	26	26	23	920	1,151	1,071	188,706	184,259	187,3
Other	—	—	3	—	—	82	—	—	12,31

Table 4. General hospitals, beds, discharged patients and rates according to hospital direction and bed groupings, Peru, 1957-1959<sup>1</sup>.

comparison to total population and a greater percentage of total deaths occurring in hospitals. These include the provinces of Pisco, Cuzco, Tacna, Trujillo, Pasco and La Convención.<sup>19</sup>

Table 4 summarizes some of the more important administrative features in general hospitals.

6. *Hospital Personnel.* Of considerable importance in hospital administration is personnel. Data for 1958 were somewhat limited but were improved for 1959. Consequently, the data

<sup>19</sup> This must not be interpreted as meaning that general death rates are higher in areas where hospital facilities are comparatively good. The general death rates in the population may actually be low. The higher death rate among hospital patients referred to is defined as follows:

$$R_D = \frac{D_h}{P_o} 1000 \text{ where,}$$

$R_D$  = death rate of hospital patients

$D_h$  = deaths occurring in hospitals

$P_o$  = estimated population of a given area where hospitals are located

Generally, in those provinces where hospital death rates are relatively high, it is interpreted that a greater percentage of the deaths in that province occur in hospitals. (For further information on death see section entitled PATIENT CHARACTERISTICS, DEATH).

	PATIENTS DISCHARGED		AVERAGE DAILY ATTENDANCE			AVERAGE LENGTH OF STAY			PERCENTAGE OF OCCUPANCY		
	1958	1959	1957	1958	1959	1957	1958	1959	1957	1958	1959
60	226,994	252,734	10,922	11,882	13,322	18	19	—	73	69	72
133	998	1,221	21	22	30	11	8	9	37	26	28
186	7,005	9,106	312	191	234	9	10	9	49	35	29
399	20,239	20,819	511	539	554	11	10	10	47	41	44
403	33,718	34,201	1,283	1,098	1,008	12	12	11	58	51	49
573	59,791	66,405	2,571	2,981	3,190	15	18	18	64	67	66
886	18,228	16,684	1,095	1,423	1,121	28	28	26	86	78	84
1357	29,984	43,980	2,223	1,662	2,449	22	20	20	84	70	73
323	57,031	60,318	2,906	3,966	4,736	24	25	29	95	89	101 <sup>a</sup>
136	106,345	108,201	5,860	6,330	6,994	20	22	24	76	79	—
177	32,957	35,953	1,297	1,351	1,426	16	15	15	77	58	—
544	34,322	48,914	1,795	2,155	2,741	19	23	20	85	85	—
349	11,591	13,307	713	825	890	28	26	24	67	56	—
329	23,575	24,739	741	717	725	11	11	11	51	44	—
825	18,204	19,788	517	505	513	10	10	9	56	44	—
—	—	1,832	—	—	33	—	—	6	—	—	—

<sup>1</sup> Figures for 1959 are tentative.

<sup>2</sup> Includes 15,599 adult beds, 1594 children's beds, 1212 cribs.

<sup>a</sup> Calculation is based on unrevised data.

presented here are tentative figures for 1959 for all hospitals.

In respect to medical personnel in all hospitals, slightly over 50 per cent of all physicians employed (2,462) worked part time. Part time is defined roughly as work from a few minutes to four hours a day. No statistics are yet available on the exact number of hours normally worked. Only 868 or 35 per cent worked full time. About 10 per cent of all doctors were classified as ad-honorem.

The Beneficencia hospitals employed the greatest number of physicians (778) but the number working full time was only 12 per cent of the total employed in 70 hospitals. This fact, alone, would appear to be a serious limiting factor in respect to adequate care and hospital efficiency. In the largest mental hospital in Peru operated by the Beneficencia only one full time and 46 part time physicians were employed.

On the other extreme the five armed forces hospitals employed a total of 289 physicians. Of this total, all but 71 or 75 per cent were employed full time. The industrial hospitals

employed very few part time physicians in contrast to the 38 private hospitals with 75 per cent employed part time.

The rate for physicians working full time in relation to total beds in all hospitals was one physician for each 26 beds. For general hospitals only, the rate is one for each 22 beds. In all Beneficencia hospitals, the rate is one physician for each 112 beds and for all armed forces hospitals the rate is one for each 15 beds. The general pattern in this respect is extremely variable depending on the operational direction of the hospital.<sup>20</sup>

Data are available on other professional hospital personnel such as nurses, nurses' helpers, midwives and social service workers. Slightly over 2,000 professional nurses were employed with an overall rate of one nurse per 11 hospital beds. For all general hospitals the rate is slightly lower, one nurse per 10 hospital beds. Even though the Beneficencia hospitals have the greatest number of beds and discharged patients, they have the highest ratio of beds per nurse (27). Both the armed forces and the Social Security hospitals had comparatively low ratios of beds per nurse with a rate of 4 and 5 respectively.

A total of 3,132 nurses' helpers were reported as working in all Peruvian hospitals at the end of 1959. The majority (2,788) worked in general hospitals. The ratio of nurses to nurses' helpers in all hospitals was 2 to 3. However, in the Beneficencia hospitals, the ratio was almost 1 to 3.

The ratio between total hospital beds and nurses' helpers was 8.6, i.e., one nurse's helper per 8.6 beds. The ratio varied according to hospital direction with the Beneficencia hospitals having a ratio of 12, the armed forces hospitals, 8, and the Ministry of Public Health, 9. The armed forces hospitals are the only group in which there were more nurses than nurse's helpers.

It is customary in Peru to use midwives for delivery even in large hospitals. The physicians very often attend the birth in complicated situations only. In all hospitals 394 midwives

<sup>20</sup> No rates have been attempted for physicians working part time or ad-honorem because the proportion of time worked is unknown.

were employed. The majority were in the Social Security hospitals (119) and the maternity hospitals of the Beneficencia (130).

Although the need is much greater, only 113 social service workers were employed by all hospitals and the majority worked in general hospitals.

When the numbers of doctors, nurses and other medical personnel working in hospitals are classified by provinces, the extreme variation in geographical distribution is readily recognized. Doctors working in hospitals in Lima were almost 60 per cent of the total and served a population which is almost 15 per cent of Peru's population. On the other hand, to give an example, the whole Department of Ancash with an estimated five per cent of the population had only one per cent of the doctors. In respect to beds per nurse, the Province of Lima (which includes metropolitan Lima) had 8 beds per nurse and 9 beds per practical nurse. The Department of Ancash had 26 beds per nurse and 12 per practical nurse. A principally indigenous high plain area, the Province of Puno with 174 hospitals beds had, in 1958, 58 beds per nurse and 58 per practical nurse. One of the lowest ratios of beds per nurse is in the Province of Callao with 5 beds per nurse.

The majority of other professional hospital workers is found in the Province of Lima. These include midwives (196 out of a total of 314 reported), social workers (92 out of a total of 113). These latter data were reported for 1958.

#### PATIENT CHARACTERISTICS

1. *Cause of Hospitalization, Sex and Age.* The age group 20-24 had the greatest absolute number of discharged cases for both sexes and for either sex. This was true even if normal delivery maternity cases are subtracted from the total number hospitalized. The second greatest number hospitalized was within the 25-29 age group for both sexes and for either sex taken separately. The third greatest number hospitalized fell within the 0-4 age group. Because of the unavailability

of a reliable age distribution of the population it is not possible to compute age-specific hospitalization rates. However, it is suspected that the large numbers of hospitalized persons in the above-mentioned age groups are due, in part, to a greater number of persons in the population in those age groups, especially in the 0-4 age group. In the age groups 20-29, the high hospitalization incidence is also attributed to the comparatively large number of admissions for pregnancy complications and for accidents occurring in this age interval, especially to the male sex.

In all five-year age groups from 15 to 39 years, more females were hospitalized than males when pregnancy cases are included. In all other 5-year age groups, more males were hospitalized than females. If the numbers of females hospitalized due to pregnancy and complications of pregnancy are subtracted from the total, the number of males hospitalized was greater in all age groups. If a sex ratio of 100 is assumed, this would indicate a higher hospitalization rate for males in

Table 5. Number of hospital patients by sex and age discharged in Peru, 1958. (All hospitals)

AGE GROUP	TOTAL	MALE	FEMALE
ALL AGES	263,120	115,840	147,280
Under 1 Year	9,210	4,835	4,375
1-4 Years	11,805	6,560	5,245
5-9 Years	9,420	5,725	3,695
10-14 Years	9,240	5,565	3,675
15-19 Years	27,490	11,065	16,425
20-24 Years	50,125	18,165	31,960
25-29 Years	42,560	13,755	28,805
30-34 Years	29,290	10,690	18,600
35-39 Years	20,925	8,320	12,605
40-44 Years	12,940	6,735	6,205
45-49 Years	9,950	6,030	3,920
50-54 Years	7,615	4,780	2,835
55-59 Years	6,395	4,315	2,080
60-64 Years	4,790	3,065	1,725
65 and Over	8,565	5,255	3,310
Unknown	2,800	980	1,820



all age groups. Table 5 gives the sex and age distribution of all discharged patients.

The listing of the most important causes of hospitalization in order of number of cases is an over simplified presentation because the relative importance of a particular condition depends on how it is classified in a long list of causes of hospitalization.<sup>21</sup> However, when a more or less arbitrary grouping is made of causes for which the greatest numbers of hospitalization were reported, a rough pattern of the most important causes of hospitalization emerges in terms of absolute numbers.<sup>22</sup> The principal causes of hospitalization are listed in Table 6.

During 1958, the greatest number of patients in all hospitals in Peru were hospitalized for normal childbirth. These patients were 40 per cent of all females hospitalized. Slightly over 50 per cent of the cases were between the ages of 20 and 29 years and slightly over 13 per cent were 19 years of age or

Table 6. Principal causes of hospitalization, Peru, 1958. (All hospitals)

CAUSES OF HOSPITALIZATION	RANK ORDER	TOTAL	PER CENT*	NUMBER OF PATIENTS** BY SEX	
				Male	Female
Normal Childbirth	1	55,950	21.0	—	55,950
Tuberculosis, Respiratory	2	10,500	4.0	6,805	3,695
Abortion without mention of Infection or Toxemia	3	10,420	4.0	—	10,420
All Fractures	4	8,585	3.3	7,095	1,490
Acute Tonsillitis	5	7,820	3.0	4,285	3,535
Gastroenteritis and Colitis	6	7,080	3.0	4,995	2,085
Complications of Childbirth	7	7,245	2.8	—	7,245
Cuts and Open Injuries	8	6,885	2.6	5,870	1,015
Appendicitis	9	6,445	2.5	3,010	3,435
Superficial Lesions, Concussions and Bruises	10	6,065	2.3	5,050	1,015
Pneumonia and Bronchopneumonia	11	6,015	2.3	3,685	2,330
Hernia and Intestinal Obstruction	12	5,480	2.0	3,480	2,000

\* Per cent of total hospitalized patients of both sexes.

\*\* Estimates based on a sample from 269,700 patients discharged.

<sup>21</sup> This is illustrated in the case of cancer classified by detailed site. The number of hospitalized cases due to any one particular site will be comparatively small, but all sites combined into one classification of malignant neoplasms far exceeds, for example, malaria.

<sup>22</sup> INTERNATIONAL CLASSIFICATION OF CAUSES OF DEATH, SICKNESS AND INJURIES, published by the World Health Organization was used as a basis for classifying causes of hospitalization.

under. Almost exactly one-half of the women hospitalized for normal childbirth were in special maternity hospitals.

Second in order of absolute numbers are patients hospitalized for tuberculosis of the respiratory system. Almost twice as many males were hospitalized as females. This preponderance of male patients over females suggests a general susceptibility rate differential.<sup>23</sup> Again, rates of hospitalization for tuberculosis by age groups have not been computed because reliable population figures by age are not available. However, the greatest absolute number of patients including both sexes is in the age group 20-24 (2,095). Male patients were about 75 per cent of this total (1,450).

An important cause of hospitalization is abortion, without mention of infection or toxemia. The greatest incidence of this occurred in the age group 25-29. In comparison to hospitalization for normal childbirth, the ratio is only one abortion to 9 normal births in the 20-24 age group, while in the age group 25-29, the ratio is 1 to 5 and in the 30-34 age group, the ratio is 1 to 4. For the 35-39 group it is 1 to 3 and for the 40-44 age group, it is 1 to 2. As age advances, the ratio between discharged patients who had a normal childbirth and those who had an abortion becomes smaller and smaller.

Hospitalization for fractures, including the face and head, constitutes a considerable proportion of the total hospitalized. Slightly over 80 per cent of these patients are males and this cause accounts for about 6 per cent of all males hospitalized. Undoubtedly, the vast majority of these cases were the result of accidents or fights and could have been avoided.<sup>24</sup> The greatest incidence in terms of absolute numbers is in the 20-24 age group for males and the 40-44 age group for women.

Other important single causes of hospitalization were: acute tonsillitis, with slightly more cases among males and a rather heavy concentration in the 5-29 year age groups; gastroenteritis

<sup>23</sup> An assumption is that females have the same probability for being hospitalized as males.

<sup>24</sup> Tabulations on external causes are not yet available in the published tabulations.

and colitis of various types with over twice as many males as females and with heavy concentration in the age group less than 5 years, especially less than one year; childbirth with complications, which showed no pronounced age pattern; cuts and open injuries, concentrated overwhelmingly in the male sex and especially in the age group 20-29; appendicitis, which is almost evenly divided between males and females; and superficial lesions, concussions and bruises most of which affected male patients in the 15 to 29 year age groups.

2. *Usual Place of Residence of Discharged Patients.* The extent of inaccurate reporting of usual place of residence in these hospital statistics has not yet been investigated. The error arises from the reporting of usual place of residence as the same city or locality in which the hospital is located rather than the locality where the patient actually resides. Probably a converse condition is more rare. Nevertheless, the statistical tables show some unmistakable patterns when patients discharged from hospitals in one department are classified according to the department (state) in which a patient usually resides. This tabular arrangement indicates the use of hospitals located in one department by patients normally residing in another. It also shows the "pulling power" of hospitals located outside the area of a patient's usual residence and the interaction between these hospitals and the patients who use them.

As would be expected, the great preponderance of patients used the hospitals located in the same department as the patient's residence. Somewhat unexpected was the considerable migration of patients for hospitalization in departments other than the one in which they normally live. This was especially true for the hospitals located in the Departments of Callao, Tacna, Pasco, Lima and Ancash. A comparatively large percentage of the total discharged patients from all hospitals located in these departments reported their usual place of residence outside these departments.

The Department of Callao borders the highly populous De-

partment of Lima. Thirty-eight per cent of all patients hospitalized in Callao reported their residence as outside, and 20 per cent of them reported Lima as the usual place of residence even though Lima has 31 hospitals and more highly specialized facilities. The number of patients residing in Callao who utilized Lima facilities amounted to slightly less than 2 per cent of all patients discharged from Lima's hospitals.<sup>25</sup>

The Department of Tacna, in the southern part of Peru bordering the Republic of Chile, has the greatest number of beds and patient discharges per unit of population in Peru. It drew 17 per cent of all its patients from other provinces, principally from the neighboring Department of Moquegua. The Department of Pasco located in the Sierra received 17 per cent of its patients from other departments; and Ancash, a department partly on the coast but mostly in the Sierra, received 13 per cent of its patients from other areas. In all of the areas previously specified, the total number of hospital patients residing in a given department was always less than the total number of patients actually hospitalized in that department. And, of course, the number of patients hospitalized from a given department in which they reside always was less than the total number of patients hospitalized because some of the total came from other departments. The difference between these two figures is a measure showing the extent to which the hospital facilities in one department or area are serving other areas.

Also of interest is the reverse situation, in which the total number of hospitalized patients residing in a department was greater than the total number of patients hospitalized in hospitals of the same department. The difference between these two figures is a measure which indicates possible limited or faulty facilities because these persons were going elsewhere

<sup>25</sup> The explanation for this unusually high percentage of use of Callao facilities by Lima residents is not readily available without further detailed data. These two metropolitan areas border each other and interaction of all types including hospitalization is easy. It is possible that a large number of the Lima residents hospitalized in Callao are maternity patients who, because of crowded conditions in Lima maternity hospitals, go to Callao which has the necessary facilities.

for hospitalization. Various departments fall into this category, i.e., they have a preponderance of residents hospitalized elsewhere over the actual number who were hospitalized in the department itself.

An example is the Department of Cajamarca, located in the Sierra. In 1958, there were 3,255 residents hospitalized either in Cajamarca or in other departments. However, the total number in hospitals located in Cajamarca was only 1,875, and only 1,710 of these were actually residents of Cajamarca. This is interpreted as meaning that apparently facilities were available for only 1,875, whereas facilities for at least 3,255 patients were needed; and the difference between these two figures represents patients who either had to go elsewhere because of no facilities or who chose to go elsewhere because facilities were faulty, limited or inconvenient. About 20 per cent of the total residents hospitalized were hospitalized in Lima hospitals, 20 per cent in the Department of La Libertad hospitals, about 10 per cent in other departments and the remainder in hospitals in Cajamarca. The Department of Ayacucho, also in the Sierra, indicated a similar condition. In the case of the Department of Huanuco, 4,105 resident patients were hospitalized of whom 3,055 were hospitalized in Huanuco hospitals. This figure was almost equal to the total number hospitalized in hospitals in Huanuco, which left about 1,000 residents of Huanuco to be hospitalized outside of Huanuco.

The foregoing are examples of large areas in which hospital facilities are not sufficient for the number of persons desiring hospitalization. However, this may not be because there are not enough beds but rather because the medical care is poor, laboratory facilities are unavailable or for a variety of other reasons which discourage the use of available facilities.

3. *Cause of Hospitalization and Usual Place of Residence.* The Department of Lima with its relatively adequate hospital facilities has about 13 per cent of the population of Peru. However, residents of this department made up 36 per cent of the total patients hospitalized. By contrast, the Depart-

ment of Puno which has an indigenous population and borders Bolivia, has about 6.4 per cent of Peru's total population, contributed only 1.6 per cent of the total patients hospitalized. This is additional evidence of the mal-distribution of hospital facilities and indicates apparently that people use the facilities if they are available.

Space permits only a few observations on the relation between cause of hospitalization and usual place of residence. Although it is true that tuberculosis has a comparatively high incidence in all departments in Peru, almost 30 per cent of all tuberculosis (respiratory) patients gave their place of residence as the Department of Lima. Many of these patients are low income migrants who contribute to the high incidence. Using the Department of Puno again as an example, we would expect that about 6.4 per cent of the patients hospitalized for tuberculosis would report their residence as Puno. However, this percentage is only 3. Among patients hospitalized for normal childbirth, over 50 per cent resided in Lima and less than 1 per cent lived in Puno.

For practically all causes of hospitalization, residents of the Department of Lima have high estimated rates of hospitalization. Notable exceptions are infectious hepatitis, for which the Department of La Libertad has a much higher estimated rate; malaria, for which the mountainous Department of Junin and various other departments have higher hospitalization rates; and intestinal parasitosis for which the jungle Department of Loreto has a rate which far exceeds that of Lima.

Differential hospitalization rates by specific cause according to locality are important to analyze in order to predict what special facilities should be introduced and planned for in a given locality. Differential cause of death rates, differential communicable disease rates and other morbidity data are equally important. The foregoing account suggests need for more analysis in depth.

4. *Cause of Hospitalization and Habitual Occupation.* Some data are available on habitual occupation of patients discharged

from hospitals. When patients are classified into two groups, those who were gainfully employed and those who were not, it is found that 56 per cent of the total patients were not gainfully employed. This group includes children, students, unemployed, retired, invalids and persons living on independent income.

Among those not gainfully employed, 43 per cent were women between the ages of 15 and 49 who were hospitalized for childbirth or complications of pregnancy. About 3 per cent were hospitalized for acute tonsillitis, 3 per cent for tuberculosis (all forms), 3 per cent for gastroenteritis and colitis, slightly less than 3 per cent for pneumonia and bronchitis, almost 5 per cent for injuries including fractures, open wounds, lesions, concussions, etc. All other patients in this group were distributed in lesser percentages throughout the various causes of hospitalization.

Among those gainfully employed, a group comprised of service workers, manual laborers, members of the police force and similar workers had the greatest number of patients hospitalized. Of this number, 7 per cent were hospitalized for tuberculosis (respiratory) and 5 per cent were hospitalized for childbirth. The rest were distributed in lesser percentages over other causes of hospitalization.

Agricultural workers formed the second largest occupational group hospitalized. The greatest single cause of hospitalization for this group was tuberculosis.<sup>26</sup>

*5. Cause of Hospitalization, Patient Days and Length of Stay.* As previously mentioned, the average length of stay for all patients discharged from all general hospitals in Peru was 19 days in 1958. Using an arbitrary classification of less than 3 days stay, 3-5 days, 6-9, 10-19, 20-49, 50-99 and 100 days stay and over, we found that the greatest number of patients was in the 3-5 day group and the second greatest number in the 6-9 day group. In terms of percentages, this amounted to 28

<sup>26</sup> Differential rates of hospitalization by occupation are not possible to compute because of the lack of census figures indicating population distribution by occupation.

per cent and 20 per cent respectively. Almost 63 per cent of all patients discharged from general hospitals had been hospitalized for 9 days or less and 94 per cent had been hospitalized less than 50 days.

Single causes of hospitalization having a relatively high average length of stay are vascular lesions (159 days), respiratory tuberculosis (80 days), senility without mention of psychosis (55 days), osteomyelitis and parasitosis (53 days), paralysis with cerebral origin (52 days) and forms of tuberculosis other than respiratory (48 days). Chronic rheumatic heart disease, cancer affecting inaccessible areas, and leishmaniosis are causes of hospitalization having a relatively high average length of stay.

Causes for which the stay was relatively short included effects from poisoning, wounds caused by sharp objects, abortion without mention of infection, hypertrophy of the tonsils, normal childbirth, toxemia of pregnancy, malaria and acute tonsillitis.

Of interest is the comparative "hospital load" by selected causes of hospitalization using the total number of patient days

Table 7. Patients discharged, patient-days, average length of stay by cause of hospitalization, (general hospitals) Peru, 1958.

CAUSES OF HOSPITALIZATION	TOTAL DISCHARGED	PATIENT DAYS	AVERAGE LENGTH OF STAY (DAYS)
Tuberculosis, Respiratory	9,180	732,385	80
Pneumonia, Bronchitis, Bronchopneumonia and Other Diseases of the Respiratory System	16,970	230,785	13
Fractures	6,995	214,600	31
Normal Childbirth	28,580	157,335	6
Tuberculosis (Other Forms)	2,145	103,560	48
Gastroenteritis and Colitis	7,775	105,350	14
Hernia and Intestinal Obstruction	5,430	103,480	19
Lacerations and Open Wounds	6,845	92,745	14
Other Diseases of the Digestive System	5,035	91,395	18
Malignant Tumors	2,515	86,065	33
Cholelithiasis and Cholecystitis	4,350	83,265	19



as an index. Table 7 indicates selected causes having the greatest number of patient-days for all *general* hospitals.

By far the greatest hospital load in general hospitals is due to tuberculosis. If all hospitalizations as a result of accidents and violence of various kinds are grouped together, the total patient days would exceed 500,000 with fractures being the principal single cause of hospitalization. For diseases of the digestive system, if all are grouped together, patient days would exceed 400,000. All causes of hospitalization connected with pregnancy amount to 250,000 patient days. These general groupings are the principal causes of hospitalization that provide the greatest hospital load in general hospitals.

However, it must be taken into account that the above figures do not include patients discharged from special hospitals such as tuberculosis, cancer, maternity, etc. Table 8 indicates these causes of hospitalization having the greatest number of patient days for all special hospitals.

The infectious disease group listed in Table 8 represents comparatively few patients but many patient days. Most of these patients were cases of leprosy or advanced chronic venereal disease.

If the number of patient days for respiratory tuberculosis reported by special hospitals is added to that for cases in general hospitals, the total is slightly over 1,200,000 patient

Table 8. Patients discharged, patient-days, average length of stay by cause of hospitalization, (special hospitals) Peru, 1958.

CAUSES OF HOSPITALIZATION	TOTAL DISCHARGED	PATIENT DAYS	AVERAGE LENGTH OF STAY (DAYS)
All Infectious Diseases except Respiratory Tuberculosis	585	978,470	1,672
Tuberculosis (Respiratory)	1,320	469,010	355
Normal Childbirth	27,370	147,475	5
Psychosis	410	130,690	319
Psychoneurosis and Similar Symptoms	200	47,150	236
Malignant Tumors	1,280	27,955	29
Childbirth with Complications	3,525	26,795	8

days. This one disease represents a formidable tax on hospital facilities. It is interesting to note that more patient days for tuberculosis are reported in general care hospitals than in especially designed and equipped tuberculosis hospitals.

The total number of patient days represented by normal pregnancy was slightly over 300,000, of which half were for general hospitals with maternity wards. However, all conditions connected with pregnancy accounted for 450,000 patient days in all types of hospitals, special and general.

6. *Deaths.* Less than 4 per cent of all patients hospitalized in 1958 were discharged by reason of death. The rate was somewhat higher for males than females. Children less than one year of age had the highest hospitalization death rate, with the age group 1-4, second.

Among specific causes of hospitalization, the highest rate of discharge due to death was for pneumonia and bronchopneumonia. Some deaths occur in all age groups from this cause, but the greatest proportion (72 per cent) occurred in children under four years of age.

The second cause of death in hospitals is tuberculosis. Deaths were distributed in all age groups with the 20-24 and 30-34 groups having the highest rate. Diseases common to early infancy (children less than 1 year) had a comparatively high death rate in hospitals and death from cancer (all sites) also had a high rate. In the case of cancer, deaths are distributed for the most part in the age groups above 35 years of age.

Although the Departments of Lima and Callao have only 15 per cent of the total population of Peru, 47 per cent of the patients discharged from all hospitals by reason of death reported their residence as Lima or Callao. Death rates by cause of hospitalization for this group followed the same pattern as those in all other Departments.

#### CONCLUSION

The preceding data analysis on hospital care in Peru has

been an attempt to summarize the more general aspects. It does not purport to analyze with great profundity all aspects of hospital care. It is possible, however, with existing data to formulate some general observations and conclusions which are intended to assist in future planning. A more profound analysis based on additional tabulations and more detailed data would provide more observations than are presented here.

In probably every country in the world, there is a need for more hospital care than actually exists. Peru is undoubtedly no exception. However, as in other countries, Peru apparently is not using to the fullest extent possible the facilities that are available. This was pointed out in the section on percentage of occupancy. Although exact calculations have not been made, it is estimated that at least 20 per cent more beds could be made "available" in all general hospitals, taken as a whole, providing the general percentage of occupancy could be raised from 69 per cent to 89 per cent. In addition, the gradual reduction of average patient stay in public hospitals would also increase existing facilities. However, present obstacles which do not permit greater occupancy and shorter average length of stay must be studied and corrected.

Hospital operational efficiency should be given more intensive study. It is suspected that many hospitals are being administratively operated with little or no thought to operational efficiency. Some hospitals do not maintain sufficient records in order to use them as a basis for administrative decisions. Very few hospitals employ trained hospital administrators either with medical training or non-medical administrative experience.

Preliminary tabulations of Peruvian hospital statistics for 1959 indicate a great percentage of part time medical personnel working in hospitals. For various reasons, and under present circumstances, this is probably unavoidable and would be difficult to correct. However, this condition tends to lower general efficiency and is often not in the best interests of the care given to patients. There is a high ratio of beds to physician in

many hospitals, (i.e., many beds per physician) indicating a general scarcity of professional attention. The same condition holds for professional nursing care and other professional assistance. Generally, hospital staffing seems to be one of the major problems.

Poor distribution of hospital care among the population has two aspects. The first is that some large populated areas such as Puno and Ayacucho have virtually no facilities while other areas have relatively adequate facilities. The other is that in areas where beds are available the facilities are extremely poor, thus almost negating the supposition that facilities actually exist.

Further investigation should be performed on the relative value of small hospitals, i.e., hospitals with less than 25 beds. As they exist at the present time in Peru they are obviously not serving the population in a completely satisfactory manner. Their staffing is often deficient, general facilities are lacking and the percentage of occupancy is generally low. It is possible that a hospital which is below a certain bed capacity is uneconomical and should not operate. More study is needed to determine the optimum size, using costs, population served, staffing possibilities and other criteria as a basis. Various techniques in the field of operations research have been developed for this purpose.

Because of an acute shortage of special hospital facilities in Peru some diseases of relatively high incidence such as tuberculosis, cancer and mental disease are treated in general hospitals, whereas the treatment would be more satisfactory in hospitals that have special facilities for treating these diseases. This is especially true for tuberculosis for which more patient days are recorded in general hospitals than in the five tuberculosis hospitals. Some difference of opinion exists about this conclusion. It is contended here that, even though some general hospitals may be able to properly treat all types of disease, most in Peru do not have economic resources for necessary special equipment.

In order to reduce hospital loads, consideration should be given to the stepping up and enlargement of certain aspects of preventive health programs. These should include an intensified attempt at prevention for certain diseases of relatively high hospitalization incidence. Disease and morbid conditions falling in this category are tuberculosis, most diseases of the digestive system, complications of pregnancy, diseases of the newborn, certain infectious diseases such as typhoid, paratyphoid fever and malaria, and accidents. Preventive health programs that are specifically related to these morbid conditions include tuberculosis control, mother-child and prenatal care programs, nutritional programs, sanitary engineering projects including water systems and sewage disposal, health education especially in respect to food handling, school health, safety and vaccination programs.

The average length of stay per patient in general hospitals is considerably greater in public or semi-public operated hospitals than in privately operated hospitals. For public hospitals, the cost per patient is obviously greater and of course the proportion of the population having access to hospital care is theoretically reduced. Further study is needed to determine if the long average length of stay in public hospitals is actually justified from an operational and medical point of view.

Another curious fact is that the average length of stay increases with hospital size. One possible explanation is that small hospitals do not receive serious cases calling for long periods of hospitalization.

A final observation is the need for more detailed statistics and studies in depth on the complicated relationships involved in hospital care. Virtually no detailed statistical studies have been performed on hospital care in Peru.

Some generalized facts and figures and some hypotheses have been presented and suggested. Because of the intricate nature of hospital care, its administration, high cost and general service to the community, planning and prediction must no longer be based on casual observation, guesses and impressions by ad-

ministrative and medical professionals. This applies to lesser-developed and fully developed areas alike. There can be no substitute for conclusions made and decisions reached which are based on quantitative data where logico-scientific reasoning has been employed. The decisions coming from these conclusions have a much greater probability of being those which will make possible the fulfilling of the objectives of hospital care, i.e., the provision of best facilities possible for all the population.