

INCOME AND EXPENSE RATIOS OF GENERAL HOSPITALS, 1951

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FOREWORD

This analysis of variation in income and expense ratios among nonprofit short-term general hospitals was started in the fall of 1952 as a cooperative project undertaken by the Division of Public Health Methods and the Commission on Financing of Hospital Care. Mrs. Pennell and Miss Altenderfer are statisticians in this Division. At the time of the study Mr. Stigmond was Director of Fiscal Studies of the Commission; he is now Administrative Assistant of the Albert Einstein Medical Center, Philadelphia. Dr. Altman, formerly Chief Statistician of the Commission on Financing of Hospital Care, is now Statistician, United Cerebral Palsy Associations, Inc., New York.

Some of the data will appear as part of the Commission's report, Volume III, "Factors Affecting the Cost of Hospital Care." Widespread interest in the problem of hospital finances has led to the preparation of the present brief report for simultaneous publication by the Public Health Service.

Grateful acknowledgment is made to the American Hospital Association for providing the data on which the study is based.

G. St.J. Perrott, Chief
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INCOME AND EXPENSE RATIOS OF GENERAL HOSPITALS, 1951

Much has been written in recent years about the financial plight of American hospitals and the constantly increasing costs of hospital care. The present report analyzes some of the more pertinent factors associated with the variation in hospital income and expense. The following questions are considered: What proportion of the nonprofit short-term general hospitals operate at a deficit, and how large are these deficits? In comparison with the hospitals operating at a surplus do the hospitals with deficits have more or less extensive programs, higher or lower costs per patient day, larger or smaller staffs, and greater or lesser occupancy? How much do hospitals vary in expense per patient day? What is the relationship between expense and such items as bed capacity, occupancy, scope of program, and amount and source of income?

Material and Method

The information on hospital income and expense ratios was derived from basic data supplied by the American Hospital Association. The Association has, in the period since 1946, developed a system of annual reporting of fairly comprehensive data on organization, facilities, services, and finances of individual hospitals. The resulting statistics, which are published each year in the Administrator's Guide issue of the Association's *Journal, Hospitals*, have added greatly to existing knowledge about American hospitals as a whole. Pressure on the Association for the prompt publication of the figures, however, has limited the amount of analysis.

The present study, which is essentially a more detailed analysis of certain portions of the data collected by the American Hospital Association, was a cooperative project undertaken by the Commission on Financing of Hospital Care and the Division of Public Health Methods, Public Health Service, U. S. Department of Health, Education, and Welfare. The Association made its machine tabulation cards available for the analysis.

Only general hospitals caring for acute conditions, with an average length of patient stay of less than 30 days, are included in this study. Excluded are chronic disease and convalescent hospitals serving patients with long-term illness. Also no attempt has been made to analyze income and expense ratios for mental and tuberculosis hospitals, or for allied special hospitals that serve either special groups of the population (such as industrial and pediatric hospitals and school infirmaries) or that limit their services to patients with certain diagnoses (such as obstetric and orthopedic hospitals).

The majority of the short-term general hospitals are nonprofit, nongovernmental institutions as distinguished from hospitals under proprietary or under governmental control. To obtain data for a relatively homogeneous group, the proprietary and governmental

hospitals have been excluded from the analysis. Since utilization of services of members of religious orders affects the operating expense of Catholic hospitals, institutions listed in the 1952 Directory of the Catholic Hospital Association are also omitted.

About three-fourths of the hospitals, in replying to the American Hospital Association questionnaire, supplied all the key financial items required for this detailed analysis. These 1,515 hospitals account for 83 percent of the total number of beds in all nonprofit short-term general hospitals, since relatively more of the larger hospitals replied. For each size group, response was greater in the Northeast region than in the North Central, South, and West.

The questionnaire used by the American Hospital Association asked that statistical data be reported for the year ended September 30, 1951, or for the most recent 12-month period. From the replies 10 rates have been computed for each hospital, as follows:

Occupancy rate	= $\frac{100 \times \text{average daily census}}{\text{beds}}$
Length of stay	= $\frac{365 \times \text{average daily census}}{\text{annual admissions}}$
Total income per patient day	= $\frac{\text{total income}}{365 \times \text{average daily census}}$
Patient income per patient day	= $\frac{\text{patient income}}{365 \times \text{average daily census}}$
Percent patient income of total income	= $\frac{100 \times \text{patient income}}{\text{total income}}$
Total expense per patient day	= $\frac{\text{total expense}}{365 \times \text{average daily census}}$
Payroll per patient day	= $\frac{\text{payroll}}{365 \times \text{average daily census}}$
Percent payroll of total expense	= $\frac{100 \times \text{payroll}}{\text{total expense}}$
Full-time paid personnel per 100 patients per day	= $\frac{100 \times \text{personnel}}{\text{average daily census}}$
Percent deficit or surplus of total expense	= $\frac{100 (\text{income} - \text{expense})}{\text{total expense}}$

Variation in two of these ratios--total expense per patient day and percent deficit or surplus of total expense--has been related to variation in the other eight ratios for groups of hospitals classified on the basis of bed capacity and number of services and facilities. Such analysis indicates the primary distinguishing characteristics of hospitals which have relatively high or relatively low per diem

costs and of those which have deficits or surpluses. These ratios by themselves do not explain why costs are high or low or why deficits or surpluses occur in specific hospitals. Detailed study of each hospital's program and financial structure would be required for that purpose. Analysis of variation among groups of hospitals, however, does provide a basis for development of important generalizations and a framework by which an individual hospital may evaluate its own position.

Bed Capacity and Operating Ratios

The important characteristics of large hospitals in comparison with small hospitals are high occupancy rates, long duration of stay, high per diem income and expense, and a large number of personnel in relation to patients. Surpluses are smaller and deficits are more prevalent among the large hospitals.

Average rates for nonprofit short-term general hospitals are shown in table 1 for each of four hospital size groups: less than 50 beds, 50-99, 100-249, and 250 or more. Regional variation in these averages is also shown in the table. The distribution of the hospitals for selected rates is illustrated in figure 1 and the percentages are included in table 2.

Occupancy Rate

The average occupancy rate for the group of reporting hospitals is 75 percent. The well-recognized fact that the occupancy rates of small hospitals tend to be lower than those of large hospitals receives further confirmation here in the increase in occupancy rate from 61 percent in hospitals with less than 50 beds to 79 percent in the hospitals with 250 beds or more.

These rates are average levels of occupancy and do not indicate the variations that appear among hospitals even in the same size group. This spread in bed occupancy is illustrated in figure 1. Among the hospitals with less than 50 beds, 11 percent have occupancy rates under 40 and 3 percent have rates of 90 or higher. None of the hospitals in the largest size group have rates as low as 40 but 16 percent have rates of 90 or more. The peak occupancy rate is 60-69 for the two groups with less than 100 beds, and 70-79 for the two groups of larger hospitals.

Hospitals in the North Central region have the highest average occupancy rate, 78 percent as compared with 76 percent for hospitals in the Northeast region, 73 in the West, and 72 in the South. These differences among the regions are partly due to variation in the proportions of large and small hospitals. When size is held constant, however, the hospitals in the North Central region still tend to rank high in occupancy rates and those in the South to rank low.

Average Length of Stay

The average length of time that patients stay in nonprofit short-term general hospitals is 8.0 days, but there is very noticeable

Table 1. Average rates for 1,515 nonprofit 1/ short-term general hospitals, by bed capacity and region: 1951

Bed capacity and region	Number of hospitals	Occupancy rate	Average length of stay (days)	Income per patient day			Patient as percent of total
				Total	Patient	Other	
Less than 50 beds	428	61.1	6.1	\$15.49	\$14.30	\$1.17	92.4
Northeast	83	64.6	7.2	15.14	13.10	2.04	86.5
North Central	176	63.1	6.4	14.92	13.93	.79	94.6
South	99	55.6	5.2	15.97	14.49	1.08	93.1
West	70	59.9	5.5	17.94	16.83	1.11	93.8
50-99 beds	427	68.5	6.7	16.68	15.89	1.99	90.5
Northeast	147	69.0	7.5	16.67	14.85	2.77	86.4
North Central	114	73.0	7.1	16.40	15.21	1.19	90.8
South	127	63.4	5.9	15.00	13.99	1.19	90.1
West	39	70.6	5.9	22.19	20.81	1.38	93.8
100-249 beds	473	76.1	7.6	19.04	17.59	1.75	90.8
Northeast	187	76.2	8.4	17.92	15.98	1.94	89.1
North Central	137	79.6	7.4	19.33	18.39	1.04	94.6
South	100	73.1	7.2	17.58	15.58	2.00	88.6
West	89	74.2	6.8	23.16	22.66	2.50	90.1
250 or more beds	187	79.4	9.4	20.97	17.78	3.19	84.8
Northeast	94	77.6	10.4	20.88	16.22	4.66	85.0
North Central	42	81.8	9.2	21.80	19.76	2.04	90.6
South	36	78.9	8.2	20.04	17.62	2.42	87.9
West	15	77.2	7.4	26.04	23.96	2.48	90.5
Bed capacity and region	Expense per patient day			Payroll as percent of total	Full-time paid personnel per 100 patients per day	Deficit-surplus as percent of expense	
	Total	Payroll	Other				
Less than 50 beds	\$14.61	\$ 7.68	\$6.93	42.5	145	+ 6.0	
Northeast	14.57	7.25	6.71	54.0	148	+ 3.9	
North Central	13.90	7.37	6.53	53.0	140	+ 5.9	
South	14.63	6.96	7.67	47.6	148	+ 6.4	
West	16.98	9.21	7.77	55.6	152	+ 8.2	
50-99 beds	15.87	8.83	7.04	55.7	164	+ 3.1	
Northeast	15.12	9.09	7.01	56.4	165	+ 3.4	
North Central	15.43	8.67	6.76	56.2	155	+ 6.2	
South	14.26	7.50	6.76	52.6	165	+ 5.7	
West	20.94	12.25	8.69	58.5	178	+ 5.9	
100-249 beds	18.20	10.39	7.81	57.1	182	+ 4.6	
Northeast	17.65	10.13	7.52	57.4	182	+ 1.6	
North Central	18.22	10.63	7.99	58.3	175	+ 6.1	
South	16.26	8.50	7.76	52.3	175	+ 8.1	
West	23.88	14.22	9.66	59.5	210	+ 5.4	
250 or more beds	20.67	12.09	8.58	58.5	203	+ 1.5	
Northeast	20.49	11.92	8.57	58.2	202	- 1.0	
North Central	21.08	12.97	8.11	61.5	198	+ 3.4	
South	19.26	10.26	9.00	53.3	208	+ 4.0	
West	24.49	15.19	9.30	62.0	216	+ 6.3	

1/ Excludes Catholic and government hospitals.

variation with size of hospital. The average stay is 6.1 days in hospitals with less than 50 beds and 9.4 days in hospitals with 250 or more beds. This longer period of hospitalization in the larger hospitals is probably an indication that the more complicated types of cases are cared for where specialized facilities and services are available.

The range in average length of stay is from about 3 to 13 days (fig. 1). In the group of smallest hospitals only 7 percent have an average patient stay of 10 or more days, as compared with one-third of the largest hospitals. At the other end of the scale, 44 percent of the smallest hospitals show an average stay of less than 6 days as contrasted with only 1 percent of the largest hospitals.

Average patient stay is markedly long in the hospitals in the Northeast region (9.1 days) as contrasted with that in hospitals in the North Central, South, and West sections of the country (7.8, 7.0, and 6.7 days, respectively). This statement holds for each size group. The hospitals with 250 or more beds in the Northeast region report the longest average period of hospitalization per patient, 10.4 days, about 3 days longer than the average for hospitals of comparable size in the West.

Income Per Patient Day

The hospitals in this study report an average of \$19.28 as their total income per patient day for all size groups combined. Income per patient day increases with size of hospital, from \$15.49 in the smallest size group to \$20.97 in the largest hospitals. Income from patients (including amounts paid on behalf of patients by other persons or organizations) and income from all other sources per patient day both show increases from the smallest to the largest hospitals. Since income from sources other than patients increases with hospital size at a steeper rate than that for total income, the proportion that income from patients is of the total is least in the largest size group. Larger hospitals may have available to them such sources of income as endowment revenue.

The spread in total income per patient day among the individual institutions is wide. Five percent of the hospitals have incomes of less than \$10 per patient day, while 11 percent receive \$24 or more. Among hospitals with less than 50 beds, 15 percent have incomes of \$20 or more in comparison with nearly half of the largest hospitals. The peaks of the income curves shift forward by \$2 intervals for each of the successively larger size groups (fig. 1).

Income from patients per patient day, of course, shows the same pattern of variation with bed capacity as total income, since on the average it accounts for nearly nine-tenths of the total. One-sixth of the hospitals report that patients are the only source of their income, and an additional one-third of the hospitals derive at least 95 percent of their income from services to patients. Over one-third of the smallest hospitals are entirely dependent on patients as

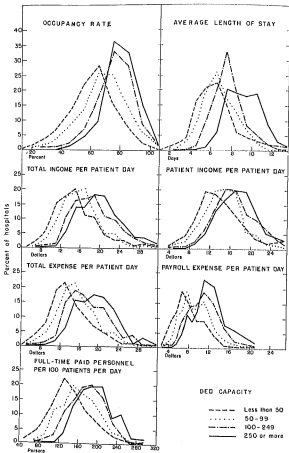


Figure 1. Distribution of 1,616 nonprofit short-term general hospitals according to seven rates, by bed capacity, 1961.

sources of income in comparison with 1 percent of the largest hospitals, as shown below:

<u>Income from patients as percent of total income</u>	<u>Percent of hospitals by size</u>			
	<u>Under 50</u>	<u>50- 99</u>	<u>100- 249</u>	<u>250 or more</u>
Total.....	100	100	100	100
100 percent.....	35	13	5	1
95.0 - 99.9.....	25	35	39	25
90.0 - 94.9.....	14	22	24	23
75.0 - 89.9.....	17	22	26	42
Less than 75.0.....	9	8	6	9

Less than 10 percent of the hospitals in each size group derive as much as one-fourth of their income from sources other than patients.

Income per patient day is markedly high in the West because of the charges in the hospitals in the Pacific States. The average of \$24.26 in the West is based on \$26.34 in the Pacific and \$18.10 in the Mountain States. In the North Central region per diem income is \$19.38; in the Northeast, \$18.85; in the South, \$17.85. Per diem income is highest in the Pacific hospitals in every size group.

Income from patients per patient day is \$22.07 in the West (\$23.91 in the Pacific States). It is \$4 lower in the North Central region and \$6 lower in the Northeast and South sections of the country. Hospitals in the geographic divisions along the eastern seaboard show the lowest ratios of income from patients to total income, reflecting the financial structure of many larger and older hospitals located in communities with a longstanding tradition of charitable contributions to voluntary hospitals.

Expense Per Patient Day

Per diem expense for the hospitals in the study averages \$18.67. As size of hospital increases so does expense per patient day, from an average of \$14.61 in hospitals with less than 50 beds to \$20.67 in those with 250 beds or more. Per diem expense increases at a slightly steeper rate than that for per diem income, with the result that the excess of income over expense decreases with an increase in size of hospital. At the same time, it is observed that in the aggregate the hospitals in each size group report income in excess of expense. For all size groups combined the excess is 3.3 percent.

The distribution of hospitals according to total expense per patient day differs markedly among the four size groups (fig. 1). The interval with the most hospitals falls at \$12 to \$14 in the smallest size group, \$14 to \$16 in the next two groups, and at \$18 to \$20 in the largest hospitals.

Payroll is the major item of hospital expense, accounting for 57 percent of total expense, with a range from 52 to 58 percent among

Table 2. Distribution of nonprofit ^{1/} short-term general hospitals according to eight rates, by bed capacity: 1951

Rate	Number of hospitals	Percent by bed capacity				
		Total	Less than 50	50-99	100-249	250 or more
All rates	1,515	100.0	100.0	100.0	100.0	100.0
OCCUPANCY RATE:						
Less than 40 percent	75	5.0	11.2	4.7	1.4	0
40-49	104	6.9	18.0	8.4	2.3	1.1
50-59	194	12.8	22.0	13.8	7.0	4.3
60-69	334	22.0	28.3	25.8	18.0	9.6
70-79	397	26.2	35.2	25.3	33.0	36.4
80-89	289	19.1	7.9	14.3	28.1	32.6
90 or more	122	8.0	2.6	7.7	10.2	16.0
AVERAGE LENGTH OF STAY						
Less than 5.0 days	158	10.4	23.6	12.0	1.3	0
5.0-5.9	225	14.8	20.0	20.6	9.7	1.1
6.0-6.9	310	20.5	22.4	25.2	19.7	5.9
7.0-7.9	331	21.8	15.4	17.1	32.5	20.3
8.0-8.9	200	13.2	5.9	12.4	18.2	19.2
9.0-9.9	122	8.1	4.7	7.0	8.0	18.2
10.0-10.9	86	5.7	3.0	2.8	5.5	18.7
11.0 or more	83	5.5	4.2	2.3	5.1	16.6
TOTAL INCOME PER PATIENT DAY:						
Less than \$10.00	70	4.7	10.3	4.5	1.5	0
\$10.00-\$11.99	112	7.4	15.0	9.1	1.7	0.5
\$12.00-\$13.99	213	14.1	17.8	17.6	10.8	5.9
\$14.00-\$15.99	269	17.7	19.9	19.2	16.1	13.9
\$16.00-\$17.99	290	19.2	11.2	20.1	16.9	13.9
\$18.00-\$19.99	215	14.1	10.5	11.7	18.2	18.2
\$20.00-\$21.99	127	8.4	4.4	5.2	11.2	17.7
\$22.00-\$23.99	101	6.7	3.0	4.9	9.7	11.2
\$24.00 or more	168	11.1	7.9	7.7	13.9	18.7
PATIENT INCOME PER PATIENT DAY:						
Less than \$10.00	143	9.4	17.0	11.0	4.2	1.6
\$10.00-\$11.99	176	11.6	19.4	12.4	6.6	4.2
\$12.00-\$13.99	248	16.4	18.5	19.4	13.1	12.8
\$14.00-\$15.99	279	18.4	15.4	20.4	20.1	16.6
\$16.00-\$17.99	259	17.1	11.0	19.0	19.9	19.8
\$18.00-\$19.99	147	9.7	7.0	5.9	11.8	19.3
\$20.00-\$21.99	107	7.1	3.5	4.9	20.1	22.3
\$22.00-\$23.99	59	3.9	2.1	1.9	6.0	5.3
\$24.00 or more	97	6.4	6.1	5.1	7.4	7.5
TOTAL EXPENSE PER PATIENT DAY:						
Less than \$10.00	94	6.3	13.3	6.5	1.9	0
\$10.00-\$11.99	142	9.4	18.9	10.3	3.0	1.6
\$12.00-\$13.99	257	17.0	21.7	19.7	14.6	5.9
\$14.00-\$15.99	275	18.1	14.7	21.8	19.0	15.5
\$16.00-\$17.99	219	14.5	10.8	14.8	17.4	17.6
\$18.00-\$19.99	178	11.7	7.0	11.9	13.5	16.6
\$20.00-\$21.99	135	8.9	4.9	4.7	13.3	16.6
\$22.00-\$23.99	93	6.1	2.8	4.9	7.6	12.8
\$24.00 or more	122	8.0	5.9	5.4	9.7	15.0
PAYROLL EXPENSE PER PATIENT DAY:						
Less than \$5.00	101	6.7	15.2	5.1	3.0	0
\$5.00-\$5.99	110	7.3	11.9	10.3	2.7	1.1
\$6.00-\$6.99	100	11.9	18.9	11.9	8.5	4.3
\$7.00-\$7.99	223	14.7	15.9	18.5	11.6	11.2
\$8.00-\$8.99	193	12.7	12.9	13.1	14.0	8.6
\$9.00-\$9.99	104	18.1	8.9	13.1	14.4	11.8
\$10.00-\$11.99	239	15.8	8.9	15.5	19.4	23.0
\$12.00-\$13.99	154	10.2	4.4	6.6	14.4	20.2
\$14.00 or more	131	8.6	3.0	5.9	12.0	19.2

^{1/} Excludes Catholic and government hospitals.

the four size groups. Payroll per patient day reaches a peak between \$6 and \$8 for hospitals with less than 100 beds; the peak is \$4 higher for the larger hospitals.

The proportionate number of employees required to care for patients increases with the size of the hospital. The number of full-time paid personnel per 100 patients per day--186 for all size groups combined--is 145 for hospitals with less than 50 beds and 203 for the largest hospitals. Within each size group, however, some hospitals report that the number of employees is more than twice the average patient census and some report less than 1 employee per patient per day. By size group the distribution of hospitals is as follows:

<u>Full-time paid personnel</u> <u>per 100 patients per day</u>	<u>Percent of hospitals by size</u>			
	<u>Under</u> <u>50</u>	<u>50-</u> <u>99</u>	<u>100-</u> <u>249</u>	<u>250 or</u> <u>more</u>
Total.....	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
Less than 120.....	27	16	5	1
120-159.....	40	33	25	16
160-199.....	21	32	40	38
200 or more.....	12	19	30	45

Regional differences in per diem expense correspond to those observed for per diem income. Expenses, especially for payroll, are highest in the Pacific States and lowest in the South for each size group.

Deficit or Surplus and Operating Ratios

High expense per patient day is an outstanding characteristic of hospitals with deficits. When compared with hospitals of similar size with surpluses, those with deficits have low occupancy rates, long duration of stay, low income from patients per patient day, and high per diem expense for both payroll and other expenses.

To study the differences between hospitals operating with deficits and hospitals showing surpluses the 1,515 hospitals under consideration are divided into four groups: (1) those with a deficit of 5 percent or more; (2) those with a deficit of less than 5 percent; (3) those with a surplus of less than 5 percent, including the hospitals whose income equals expense; and (4) those with a surplus of 5 percent or more of total expense.

In 1951, three-fourths of the hospitals were able to finance current operations from current income and only one-fourth had a deficit.¹ In terms of extremes, 8 percent report a deficit of 5 percent or more, while another 8 percent report a surplus amounting to

¹The Commission on Financing of Hospital Care studied the American Hospital Association reports for 1951 and 1952 received from 1,496 nonprofit short-term general hospitals. The distribution of hospitals according to deficit or surplus was almost the same in 1951 and 1952. One-eighth of the hospitals had a deficit in both years, one-fourth had a deficit in one of the two years, and 62 percent had no deficit in either year.

Table 3. Deficit or surplus as percent of total expense for nonprofit ^{1/} short-term general hospitals, by bed capacity and region: 1951

Bed capacity and region	Number of hospitals	Percent by deficit or surplus				
		Total	Deficit 5% or more	Deficit 0.1-4.9%	Surplus 0-4.9%	Surplus 5% or more
All hospitals	1,515	100	8	18	33	41 ^{2/}
Northeast	511	100	12	25	37	26
North Central	469	100	7	13	33	47
South	362	100	6	16	28	50
West	173	100	7	10	31	52
Less than 50 beds ..	420	100	10	10	32	48
Northeast	83	100	15	11	37	37
North Central	176	100	10	11	30	49
South	99	100	9	7	34	50
West	70	100	9	10	28	53
50-99 beds	427	100	10	17	30	43
Northeast	147	100	14	18	36	32
North Central	114	100	10	11	30	49
South	127	100	6	22	22	50
West	39	100	5	10	34	51
100-249 beds	473	100	5	21	34	40
Northeast	187	100	7	35	36	22
North Central	137	100	2	14	38	46
South	100	100	3	11	27	59
West	49	100	6	10	33	51
250 or more beds ..	187	100	8	26	41	25
Northeast	94	100	15	29	42	14
North Central	42	100	0	24	40	36
South	36	100	3	28	39	30
West	15	100	7	7	33	53

^{1/} Excludes Catholic and government hospitals.

^{2/} Of these 624 hospitals, 271 reported surpluses of 5.0-9.9 percent; 166, surpluses of 10.0-14.9 percent; 71, surpluses of 15.0-19.9 percent, and 116, surpluses of 20.0 percent or more.

20 percent or more (table 3). Surpluses of 5 percent or more are relatively more frequent among the smaller hospitals.

More than one-third of the hospitals in the Northeast region show a deficit, in contrast to one-sixth of those in the West. For each size group, a larger proportion of the hospitals in the West than in the Northeast region show a surplus of 5 percent or more. In fact, over half of the hospitals in every size group in the West report a surplus of this level (fig. 2).

How the hospitals with deficits and the hospitals with surpluses compare in terms of operating ratios is shown in table 4. In each size group, occupancy rates are higher in the hospitals with a surplus; they are consistently lowest in the hospitals with the greatest deficits. This finding illustrates the aphorism that the most "expensive" bed in the hospital is the unoccupied bed. The im-

portance of the occupancy factor is demonstrated by the fact that if the group with deficits had accommodated sufficient additional patients to bring their occupancy to the level of the hospitals with surpluses (without any additional expenditure of money and with no drop in per diem income from patients), their deficits would have been wiped out. These suppositions are not wholly realistic, but the relationship between fixed and variable costs in hospitals is such that an increase in occupancy can be expected to result in a much smaller increase in expenditures. The low occupancy among the hospitals with deficits accounts in part for their high costs per patient day and their resulting deficits.

Average length of stay, on the other hand, is greater in the hospitals with a deficit than in those with a surplus for each size group. Average patient stay in the largest hospitals with a 5-percent-or-more deficit is 11.4 days, as compared with 8.7 days in hospitals with surpluses of this magnitude. The hospitals with deficits include many teaching hospitals characterized by both long stay and high

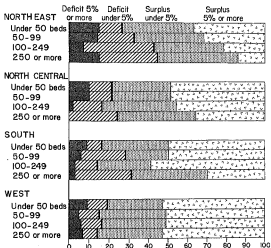


Figure 3. Percentage distribution of 1,515 nonprofit short-term general hospitals according to deficit or surplus, by region and bed capacity: 1951.

Table 4. Average rates for 1,515 nonprofit ^{1/} short-term general hospitals, by bed capacity and deficit or surplus: 1951

Bed capacity and deficit or surplus	Number of hospitals	Occupancy rate	Average length of stay (days)	Income per patient day			Patient as percent of total
				Total	Patient	Other	
All hospitals:							
Deficit 5% or more ...	125	69.0	9.2	\$20.20	\$15.58	\$4.62	77.1
Deficit 0.1-4.9%	253	74.7	8.7	19.45	16.61	2.84	85.4
Surplus 0-4.9%	303	77.1	8.0	18.97	17.05	1.92	89.9
Surplus 5% or more ...	624	75.1	7.4	19.30	17.54	1.76	90.9
Under 50 beds:							
Deficit 5% or more ...	44	54.4	6.5	15.41	13.87	1.54	90.0
Deficit 0.1-4.9%	43	58.6	6.2	14.64	13.71	.93	93.7
Surplus 0-4.9%	138	62.4	6.1	15.07	14.05	1.02	93.3
Surplus 5% or more ...	203	62.2	6.0	15.96	14.70	1.26	92.1
50-99 beds:							
Deficit 5% or more ...	42	64.2	7.2	15.22	13.66	1.56	89.7
Deficit 0.1-4.9%	72	68.2	6.8	15.67	14.08	1.59	89.9
Surplus 0-4.9%	127	70.3	6.8	16.44	14.90	1.54	90.7
Surplus 5% or more ...	186	68.4	6.5	17.55	15.98	1.63	90.7
100-249 beds:							
Deficit 5% or more ...	83	67.6	8.2	15.97	14.35	1.59	90.1
Deficit 0.1-4.9%	100	74.5	8.1	18.59	16.74	1.85	90.1
Surplus 0-4.9%	162	77.6	7.6	18.73	16.98	1.80	90.4
Surplus 5% or more ...	188	77.2	7.4	19.84	18.17	1.67	91.6
250 or more beds:							
Deficit 5% or more ...	16	74.0	11.4	24.23	16.94	7.29	69.9
Deficit 0.1-4.9%	48	77.5	10.0	21.11	17.18	3.93	81.4
Surplus 0-4.9%	76	81.0	9.1	20.29	18.05	2.24	88.9
Surplus 5% or more ...	47	81.6	8.7	20.58	18.43	2.15	89.5
Bed capacity and deficit or surplus	Expense per patient day				Full-time paid personnel per 100 patients per day	Deficit-surplus as percent of expense	
	Total	Payroll	Other	Payroll as percent of total			
All hospitals:							
Deficit 5% or more ...	\$22.25	\$12.98	\$ 9.67	56.5	210	- 9.2	
Deficit 0.1-4.9%	19.76	11.44	8.32	57.9	197	- 1.6	
Surplus 0-4.9%	18.55	10.74	7.81	57.9	184	+ 2.3	
Surplus 5% or more ...	17.26	9.75	7.51	56.5	175	+11.8	
Under 50 beds:							
Deficit 5% or more ...	18.41	8.72	9.69	47.4	154	-16.3	
Deficit 0.1-4.9%	15.00	7.92	7.08	52.8	143	- 2.4	
Surplus 0-4.9%	14.75	7.92	6.83	53.7	147	+ 2.1	
Surplus 5% or more ...	13.76	7.88	6.48	52.9	142	+15.9	
50-99 beds:							
Deficit 5% or more ...	16.76	8.93	7.83	53.3	165	- 9.2	
Deficit 0.1-4.9%	15.95	8.62	7.33	54.1	168	- 1.8	
Surplus 0-4.9%	16.12	9.04	7.08	56.1	161	+ 2.0	
Surplus 5% or more ...	15.48	8.74	6.74	56.5	163	+13.4	
100-249 beds:							
Deficit 5% or more ...	17.58	10.20	7.38	58.0	185	- 9.2	
Deficit 0.1-4.9%	18.92	10.87	8.05	57.4	188	- 1.8	
Surplus 0-4.9%	18.34	10.46	7.88	57.1	179	+ 2.4	
Surplus 5% or more ...	17.75	10.08	7.67	56.8	180	+11.7	
250 or more beds:							
Deficit 5% or more ...	26.52	15.28	11.24	57.6	243	- 8.7	
Deficit 0.1-4.9%	21.40	12.61	8.79	58.9	212	- 1.4	
Surplus 0-4.9%	19.86	11.79	8.07	59.3	198	+ 2.2	
Surplus 5% or more ...	18.67	10.61	8.06	56.8	183	+10.2	

^{1/} Excludes Catholic and government hospitals.

expense per patient day.² The long stay in the "deficit" hospitals may also result from a relatively high proportion of complicated cases requiring a multiplicity of expensive diagnostic and therapeutic procedures, with resultant high per diem expense and a high total bill. If large bills are frequently unpaid, a high proportion of long-stay complicated cases would be consistent with the high per diem costs and low per diem income found in the hospitals with deficits.

Among hospitals of the same size, the level of total income per patient day appears to have little relationship to the occurrence of either surplus or deficit. When total income is subdivided into income from patients and income from all other sources, however, very definite relationships are apparent. Income from patients is consistently low in hospitals with large deficits. While the data show that hospitals with a deficit have low per diem income from patients, they do not indicate whether the cause lies in low charges, low per diem utilization of services, or high proportion of charity work. Since income from sources other than patients is high among the "deficit" hospitals with 250 or more beds, a disproportionate amount of charity work seems to be indicated. In any event, if all hospitals with deficits received as high a per diem income from patients as that of the hospitals with surpluses, the added revenue would exceed the total deficits.

As would be expected, per diem expense increases in line with the decrease in surplus and the increase in deficit. Among the largest hospitals the average figure is \$18.67 for the hospitals with a surplus of 5 percent or more and \$26.52 for those with a deficit of 5 percent or more, a difference of nearly \$8.

Both payroll expense and all other expense increase with a rise in deficit, so that payroll as a percent of total expense remains fairly constant. The rise in payroll expense with size of hospital is explained by increases in numbers of full-time personnel. Among the largest hospitals, the average number of full-time employees per 100 patients in hospitals with the greatest deficits exceeds by 60 the average in those with the greatest surpluses. Among the smallest hospitals the difference in personnel is less. The relatively high "other" expense of the hospitals with deficits is probably related to their low occupancy rate or may result from the inclusion of the cost of major replacements or additional equipment as operating expense.

In studying these data an element to be considered is the practice followed by hospitals in handling depreciation and interest on invested capital. Although the number of hospitals that include these items in statement of expense is apparently on the increase, it is probably a safe assumption that most hospitals are still not doing

²Of the hospitals with deficits, 37 percent are approved by the American Medical Association for reimbursement; of the hospitals with surpluses, 22 percent. For the largest hospitals the proportions are 39 percent for those with deficits and 83 percent for those with surpluses.

so. If it were assumed that an allowance for depreciation of 5 percent of expense should be (and is not) included as part of a hospital's expense, then one-third of the hospitals would move from the surplus into the deficit column of table 3. If, in addition, a 10-percent allowance for interest on invested capital should be included, all but 12 percent of the hospitals would show a deficit for the year.

Per Diem Expense and Operating Ratios

Hospitals with high expense per patient day have low occupancy rates and short duration of stay in comparison with low-expense hospitals in the same size group. Income both from patients and from other sources becomes substantially higher as per diem expense goes up, but surpluses become smaller. A relatively large proportion of expenditures is absorbed by payroll, reflecting the high ratio of personnel to patients.

Table 5. Per diem expense for nonprofit ^{1/} short-term general hospitals, by bed capacity and region: 1951

Bed capacity and region	Number of hospitals	Percent by per diem expense				
		Total	Under \$12.00	\$12.00-\$15.99	\$16.00-\$19.99	\$20.00 or more
All hospitals	1,515	100	16	35	26	23 ^{2/}
Northeast	511	100	8	37	13	22
North Central	469	100	21	34	24	21
South	362	100	21	40	23	16
West	173	100	12	21	19	48
Less than 50 beds ...	428	100	32	36	18	14
Northeast	83	100	28	41	24	7
North Central	176	100	41	34	15	30
South	99	100	28	40	13	19
West	70	100	21	33	23	23
50-99 beds	427	100	17	41	27	15
Northeast	167	100	10	41	35	14
North Central	114	100	18	46	23	13
South	127	100	28	43	22	7
West	39	100	7	21	21	51
100-249 beds	473	100	5	33	31	31
Northeast	187	100	2	36	37	29
North Central	137	100	3	31	33	33
South	100	100	13	44	26	17
West	49	100	4	10	10	76
250 or more beds ...	187	100	2	21	33	44
Northeast	94	100	2	31	26	41
North Central	42	100	2	10	40	48
South	36	100	0	19	45	36
West	15	100	0	0	27	73

^{1/} Excludes Catholic and government hospitals.

^{2/} Of these 350 hospitals, 135 reported per diem expense of \$20.00-\$21.99; 93, expense of \$22.00-\$23.99; and 122, expense of \$24.00 or more.

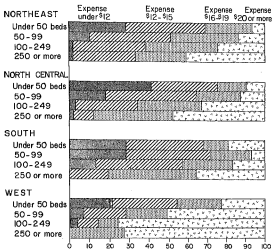


Figure 3. Percentage distribution of 1,515 nonprofit short-term general hospitals according to per diem expense, by region and bed capacity: 1951

Of the 1,515 hospitals in the study, 16 percent have a per diem expense of less than \$12, 35 percent are in the group with expense between \$12 and \$16, 26 percent in the group between \$16 and \$20, and 23 percent in the highest expense group (table 5). As was observed earlier (table 1), per diem expense varies directly with the size of the hospital. Among the hospitals with less than 50 beds, 14 percent have \$20 or more expense per patient day; in the group of largest hospitals the corresponding percentage is 44. Only 2 percent of the hospitals in the latter group have per diem expense under \$12 in contrast to 32 percent of the smallest hospitals.

The frequency distributions in table 5 also point up the regional differences previously discussed in terms of averages in table 1. Almost half of the hospitals in the West have a per diem expense of \$20 or more, a proportion more than double that in any other region.³ On the other hand, 12 percent of the hospitals in the West

³The highest level of hospital costs is reported in California, where the average per diem expense in hospitals with less than 50 beds is \$22.77, ranging upward to \$28.52 in the largest hospitals.

Table 6. Average rates for 1,515 nonprofit ¹/₂ short-term general hospitals, by bed capacity and expense per patient day: 1951

Bed capacity and expense per patient day	Number of hospitals	Occupancy rate	Average length of stay (days)	Income per patient day			Patient as percent of total
				Total	Patient	Other	
All hospitals:							
Less than \$12.00	236	70.9	7.7	\$11.32	\$10.23	\$1.09	90.4
\$12.00-\$15.99	532	74.4	7.8	14.89	13.60	1.29	91.3
\$16.00-\$19.99	397	75.9	7.9	18.64	16.88	1.76	90.6
\$20.00 or more	350	76.2	8.2	24.90	21.23	3.75	85.0
Under 50 beds:							
Less than \$12.00	138	63.6	6.9	10.94	10.24	.70	93.6
\$12.00-\$15.99	295	61.7	6.0	14.89	13.79	1.06	92.8
\$16.00-\$19.99	76	60.0	5.8	18.71	17.32	1.39	92.6
\$20.00 or more	58	55.6	5.3	24.39	22.03	2.36	90.3
50-99 beds:							
Less than \$12.00	72	71.2	7.5	10.99	9.98	1.07	90.3
\$12.00-\$15.99	177	69.2	6.0	14.69	13.43	1.26	91.4
\$16.00-\$19.99	114	65.9	6.4	18.32	16.71	1.61	91.2
\$20.00 or more	64	68.3	6.1	25.71	22.72	2.99	89.4
100-249 beds:							
Less than \$12.00	23	79.4	8.1	11.63	10.20	1.43	87.7
\$12.00-\$15.99	199	76.4	7.8	14.97	13.88	1.09	92.7
\$16.00-\$19.99	146	77.1	7.8	18.74	17.05	1.69	91.0
\$20.00 or more	145	75.9	7.2	24.44	21.92	2.52	89.7
250 or more beds:							
Less than \$12.00	3	88.8	10.6	12.55	11.23	1.32	89.4
\$12.00-\$15.99	40	79.8	9.6	14.91	13.23	1.68	88.7
\$16.00-\$19.99	61	80.1	9.0	18.62	16.72	1.90	89.8
\$20.00 or more	83	78.5	9.6	25.26	20.59	4.67	81.5
Bed capacity and expense per patient day	Expense per patient day			Payroll as percent of total	Full-time paid personnel per 100 patients per day	Deficit-surplus as percent of expense	
	Total	Payroll	Other				
All hospitals:							
Less than \$12.00	\$10.26	\$ 5.37	\$4.89	52.4	126	+10.3	
\$12.00-\$15.99	14.21	7.77	6.44	54.7	158	+ 4.8	
\$16.00-\$19.99	17.96	10.17	7.79	56.6	184	+ 3.8	
\$20.00 or more	24.55	14.59	9.96	59.5	221	+ 1.8	
Under 50 beds:							
Less than \$12.00	9.56	5.36	4.60	53.8	116	+ 9.9	
\$12.00-\$15.99	13.91	7.39	6.52	53.1	144	+ 6.8	
\$16.00-\$19.99	17.45	9.24	8.21	53.0	164	+ 7.2	
\$20.00 or more	24.55	12.21	12.34	49.7	193	- 0.7	
50-99 beds:							
Less than \$12.00	10.04	5.36	4.68	53.4	124	+ 9.4	
\$12.00-\$15.99	14.00	7.72	6.28	55.2	156	+ 5.0	
\$16.00-\$19.99	17.73	9.89	7.84	55.8	173	+ 3.3	
\$20.00 or more	24.44	14.00	10.44	57.3	213	+ 5.2	
100-249 beds:							
Less than \$12.00	10.28	4.90	5.38	47.7	134	+13.2	
\$12.00-\$15.99	14.20	7.79	6.41	54.8	154	+ 5.4	
\$16.00-\$19.99	17.92	10.17	7.75	56.8	186	+ 4.5	
\$20.00 or more	23.99	13.97	9.62	59.2	212	+ 3.6	
250 or more beds:							
Less than \$12.00	11.63	6.49	5.14	55.8	139	+ 7.9	
\$12.00-\$15.99	14.46	7.86	6.60	54.4	171	+ 3.1	
\$16.00-\$19.99	18.11	10.33	7.78	57.0	188	+ 2.8	
\$20.00 or more	25.18	15.15	10.03	60.2	228	+ 0.3	

¹/ Excludes Catholic and government hospitals.

have low per diem expense (less than \$12), as compared with 8 percent of those in the Northeast region and 21 percent in the two other regions. The concentration of low per diem expense is in the smallest hospitals in all regions, as illustrated in figure 3.

The relationships between per diem expense and the various ratios within each size group are shown in table 6. When bed capacity is held constant, occupancy rates and length of stay vary inversely with per diem expense. For example, in the group of hospitals with less than 50 beds, the average occupancy rate is 64 percent in the hospitals with per diem expense under \$12, and 56 percent where expense exceeds \$20. In this same size group, average length of stay drops from 6.9 days among hospitals with the lowest expense to 5.3 days among hospitals with the highest expense.

These data apparently indicate that low occupancy at any level of bed capacity is an important contributory factor to high costs. With respect to length of stay, high expense per patient day may result from a rapid patient turnover, which may mean a low total cost to the patient. If hospitals within the same size group are treating the same types of cases and if most of the expensive services and procedures are performed during the first days of the patient's stay, then the longer stay among the hospitals with low per diem expense explains in part why these hospitals have low per diem expense.

Income rises less sharply than expense in each size group, with the result that the excess of income over expense diminishes rapidly as per diem expense goes up (last column of table 6). With respect to expense for items other than payroll, the highest figures are found among the small hospitals with high per diem expense. Part of the reason may be that many of these small hospitals--faced with unusually high expenditures for equipment or repair during 1951--handled the costs as operating expenses rather than through capital accounts and depreciation funds.

In all but the smallest hospitals the ratio of payroll expense to all expenses increases as total per diem expense increases. Among the hospitals which spend less than \$12 per patient day, wages and salaries take 52 cents of every dollar spent, compared with 60 cents of every dollar among the hospitals which spend \$20 or more per patient day. The latter hospitals spend almost three times as much for payroll per patient day as the former hospitals, while other expense items take only twice as much.

The reason for this rise in per diem payroll expense is quite clear from table 6. Hospitals which spend \$20 a day or more employ 221 full-time persons for every 100 patients in the hospital at any one time, in contrast to a rate of 126 employees in the hospitals which spend less than \$12 a day. In addition to having a high ratio of paid employees to patients, these "high cost" hospitals either pay higher than average salaries or have a large proportion of highly paid workers since payroll expense increases more sharply than the number of workers.

Table 7. Percent of nonprofit ^{1/} short-term general hospitals with specified services, by bed capacity and expense per patient day: 1951

Service	Expense per patient day					Expense per patient day				
	To- tal	Less than \$12	\$12 to \$16	\$16 to \$20	\$20 or more	To- tal	Less than \$12	\$12 to \$16	\$16 to \$20	\$20 or more
Diagnostic X-ray	88	82	86	96	98	98	94	99	100	98
Basal metabolism apparatus	73	62	72	84	86	93	83	94	94	97
Clinical laboratory	73	64	71	87	84	91	86	91	91	95
Electrocardiograph	67	56	67	74	84	88	85	89	89	92
Medical record department	51	40	51	62	66	92	85	91	93	100
Blood bank	37	34	38	38	40	58	53	59	60	59
Medical library	23	15	22	34	31	56	43	54	56	73
Outpatient department	44	36	44	49	55	49	50	50	43	53
Pharmacy	18	14	14	26	31	41	24	37	47	61
Therapeutic X-ray	8	9	3	12	16	33	26	29	35	47
Physiotherapy department	12	12	9	17	14	20	18	15	20	36
Cancer clinic	3	3	2	4	3	18	12	19	14	27
Dental department	5	5	4	4	10	15	17	12	16	17
Routine chest X-ray	11	11	9	13	17	17	12	18	19	16
Social service department	2	4	1	1	3	3	1	4	4	5
Postoperative recovery room ...	3	0	4	8	2	6	6	4	8	11
Electroencephalograph	2	1	3	1	2	2	1	2	3	3
Mental hygiene clinic	1	1	1	1	0	4	1	3	5	5
Occupational therapy department	1	1	1	0	0	2	1	2	3	2
	100-249 beds					250 or more beds				
Diagnostic X-ray	99	96	99	99	100	100	100	100	100	100
Basal metabolism apparatus	98	96	99	98	98	99	100	100	100	99
Clinical laboratory	97	91	96	96	99	100	100	100	100	100
Electrocardiograph	96	91	95	96	97	99	100	100	100	98
Medical record department	99	96	98	99	100	100	100	100	100	100
Blood bank	77	48	80	77	77	92	67	95	92	92
Medical library	87	78	78	91	95	100	100	100	100	100
Outpatient department	65	70	60	66	67	90	67	95	87	92
Pharmacy	85	65	76	89	95	99	100	100	98	100
Therapeutic X-ray	71	30	64	73	81	97	100	95	98	96
Physiotherapy department	59	35	49	59	75	51	100	90	85	96
Cancer clinic	42	39	38	42	46	75	67	82	64	81
Dental department	28	22	24	28	34	69	67	72	59	75
Routine chest X-ray	23	9	17	23	30	41	33	40	34	46
Social service department	28	22	14	34	37	71	67	65	62	81
Postoperative recovery room ...	14	13	9	14	19	39	0	30	41	43
Electroencephalograph	13	9	9	12	19	51	0	35	48	64
Mental hygiene clinic	12	0	6	10	23	40	33	38	26	52
Occupational therapy department	10	13	2	7	19	40	0	28	33	53

^{1/} Excludes Catholic and government hospitals.

Scope of Program and Operating Ratios

Range of services and size of hospital are closely related, with the result that the several ratios vary with scope of program in the same manner as with bed capacity. Hospitals with a large variety of services have a high per diem expense and a small balance of income over expense.

The relationship between kinds of services available and size of hospital is clearly demonstrated below. Without exception, the proportion of hospitals which offer each of the specific services is greater in the larger than in the smaller size groups. Three items selected for purposes of illustration show the variation with bed capacity:

<u>Bed capacity</u>	<u>Percent of hospitals with:</u>		
	<u>Clinical laboratory</u>	<u>Physiotherapy department</u>	<u>Mental hygiene clinic</u>
Under 50.....	73	12	1
50 - 99	91	20	4
100 - 249	97	59	12
250 or more	100	91	40

Table 7 shows for four per diem expense groups the percentage of hospitals of each size which offer each of 19 facilities and services specified on the American Hospital Association questionnaire. Within each size group the proportion of hospitals with any of the specified services tends to increase with increasing per diem cost. For example, among the hospitals with less than 50 beds, 64 percent of those with per diem expense of less than \$12 have a clinical laboratory compared with 84 percent of those with per diem expense of \$20 or more. Obviously, a patient day cannot be used as a unit of service, since the scope and cost of services in large hospitals are usually greater than in small hospitals.

For analytical purposes, the hospitals have been classified into four groups according to the number of selected facilities or services they make available: 0-5, 6-9, 10-13, and 14-19. But first some inquiry is necessary as to what items are being grouped; that is, do hospitals establish these services in some random fashion or is there a consistent pattern? If two hospitals have four services each, are they likely to be the same four or combinations that are quite different?

Table 8 provides a good indication of what kinds of facilities and services are apt to be included in any stated number of services. Of the hospitals with 0-5 services, 82 percent provide diagnostic X-ray, 57 percent have basal metabolism apparatus, 59 percent have a clinical laboratory, 49 percent have an electrocardiograph, and so on. Twelve of the 19 specific services are offered by less than 10 percent of the hospitals with 0-5 services. Thus, if a hospital provides four services, it is almost certain that the four include diagnostic X-ray, and highly likely that at least two of the other three are basal metabolism, clinical laboratory, or electrocardio-

Table 8. Percent of nonprofit ^{1/} short-term general hospitals with specified services, by expense per patient day and by number of services: 1951

Service	All non-profit	Expense per patient day				Number of services			
		Less than \$12	\$12 to \$16	\$16 to \$20 or more	0 to 5	6 to 9	10 to 13	14 to 19	
Diagnostic X-ray	96	87	95	99	82	99	99	100	
Basal metabolism apparatus	90	72	89	94	96	97	99	100	
Clinical laboratory	89	74	87	93	96	99	94	100	
Electrocardiograph	86	69	85	89	94	99	98	100	
Medical record department	83	60	82	90	94	98	99	100	
Blood bank	62	42	62	67	71	87	95	94	
Medical library	62	31	55	72	82	8	53	94	
Outpatient department	57	44	55	59	68	24	48	74	
Pharmacy	56	23	46	66	80	5	43	89	
Therapeutic X-ray	46	17	37	54	68	4	26	77	
Physiotherapy department	39	17	29	44	63	1	17	66	
Cancer clinic	28	10	24	30	44	2/	9	43	
Dental department	23	11	18	25	37	1	7	30	
Barium chest X-ray	20	11	17	22	29	6	11	28	
Social service department	19	8	11	23	36	2/	3	20	
Postoperative recovery room	12	3	7	15	21	1	5	14	
Electroencephalograph	12	2	7	13	24	1	3	11	
Mental hygiene clinic	10	1	6	10	23	1	1	9	
Occupational therapy department	9	3	4	8	21	0	1	8	

^{1/} Excludes Catholic and government hospitals.

^{2/} Less than 0.5 percent.

Table 9. Per diem expense for nonprofit ^{1/} short-term general hospitals, by number of selected services and regions: 1951

Number of services ^{2/} and region	Number of hospitals	Percent by per diem expense				
		Total	Under \$12.00	\$12.00-\$15.99	\$16.00-\$19.99	\$20.00 or more
0-5 services	109	100	36	39	18	7
Northeast	61	100	33	34	30	3
North Central	119	100	44	38	13	5
South	84	100	32	43	15	10
West	35	100	29	40	20	11
6-9 services	500	100	16	42	25	17
Northeast	158	100	9	48	30	11
North Central	202	100	19	43	25	15
South	155	100	23	44	21	12
West	65	100	9	23	20	48
10-13 services	327	100	6	31	34	29
Northeast	150	100	4	39	36	21
North Central	110	100	6	26	38	30
South	92	100	13	36	30	21
West	45	100	2	7	22	69
14-19 services	229	100	1	19	29	51
Northeast	142	100	1	29	31	43
North Central	38	100	0	0	29	71
South	31	100	3	26	32	39
West	18	100	0	0	6	94

^{1/} Excludes Catholic and government hospitals.

^{2/} See table 8 for listing of services.

graph. In the same way, if a hospital provides 16 services, the omitted items are likely to be 3 of the following 5: routine chest X-ray, postoperative recovery room, electroencephalograph, mental hygiene clinic, or occupational therapy department.

The relationship between the level of per diem expense and the scope of hospital service is apparent when per diem expense is determined for groups of hospitals classified according to the number of selected services they offer (table 9). At one extreme, 36 percent of the hospitals with 0-5 services have a per diem expense of less than \$12 and 7 percent have an expense of \$20 or more. At the other end of the scale only 1 percent of the hospitals with 14-19 services have the lowest per diem expense but 51 percent have the highest cost.

In all sections of the country an increase in scope of services is associated with higher per diem expense (fig. 4). The association is not clear cut, however, since a substantial number of hospitals offering few services have high per diem costs.

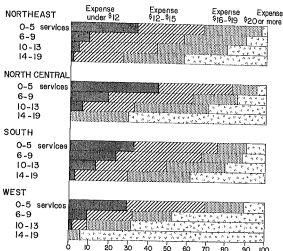


Figure 4. Percentage distribution of 1,615 nonprofit short-term general hospitals according to per diem expense, by region and number of selected services: 1951

Table 10. Expense per patient day for 1,515 nonprofit ^{1/} short-term general hospitals above and below median bed capacity, by number of services: 1951

Number of services ^{2/}	Number of hospitals	Median bed capacity	Expense per patient day for hospitals -	
			Below median bed capacity	Median bed capacity and above
0	24	23	\$10.87	\$14.07
1	17	22	10.03	11.25
2	22	23	12.82	15.37
3	56	30	12.72	12.95
4	71	34	13.54	14.19
5	120	41	14.62	14.77
6	140	90	15.66	15.20
7	135	59	15.32	14.51
8	158	64.5	15.79	15.99
9	147	94	17.40	16.84
10	114	105	17.78	17.55
11	101	135	16.77	18.02
12	96	140.5	17.33	18.26
13	86	187.5	19.14	17.99
14	64	215	20.07	18.95
15	45	280	21.21	19.99
16	62	272.5	20.72	20.01
17	24	358.5	19.52	21.67
18	25	542	27.41	21.69
19	9	541	19.92	26.72

^{1/} Excludes Catholic and government hospitals.

^{2/} See table 8 for listing of services.

Both the range of services and the size of the hospital have been shown to be related to per diem expense. That size itself is not a determinant of per diem expense but is at best a rough gauge is fairly easily demonstrated. Thus in table 10, hospitals are separated into 20 groups according to specified number of facilities or services--0, 1, 2, 3, and so forth. Then the hospitals within each group are ranked according to the number of beds and subdivided into those above and below the median size. Per diem expense was computed for each subgroup. Data arranged in this manner show that bed capacity as such has little effect on the level of per diem expense. The difference in average cost per patient day between the larger and the smaller hospitals with comparable service programs is relatively small. In 10 of the 20 groups the difference is less than \$1 per day. In 11 of the groups the larger hospitals have higher costs; in the other 9 they have lower costs.

In terms of cause and effect, it is easy to see that the scope of the hospital program could well be the underlying determinant of per diem expense. At the same time, because of the high correlation between number of services and size of hospital, the latter can

Table 11. Average rates for 1,515 nonprofit ^{1/} short-term general hospitals, by number of selected services and deficit or surplus; 1951

Number of services ^{2/} and deficit or surplus	Number of hospitals	Occupancy rate	Average length of stay (days)	Income per patient day			Patient as percent of total
				Total	Patient	Other	
0-5 services	309	61.5	6.2	\$14.76	\$11.78	\$.98	93.4
Deficit 5% or more ...	87	54.3	6.6	12.85	12.03	.82	93.6
Deficit 0.1-4.9%	39	60.4	6.9	14.42	12.99	1.43	90.1
Surplus 0-4.9%	108	62.8	6.2	14.19	13.30	.89	93.7
Surplus 5% or more ...	135	62.2	6.1	15.64	14.71	.93	94.0
6-9 services	580	71.2	6.9	16.90	15.65	1.24	92.6
Deficit 5% or more ...	56	62.3	7.1	15.72	14.04	1.68	89.3
Deficit 0.1-4.9%	79	70.0	6.9	15.26	13.89	1.37	91.1
Surplus 0-4.9%	173	72.3	7.1	16.46	15.37	1.09	93.4
Surplus 5% or more ...	272	72.4	6.7	17.07	16.63	1.24	93.1
10-13 services	397	77.1	7.7	18.90	17.16	1.74	90.7
Deficit 5% or more ...	23	65.4	8.0	15.84	14.29	1.55	90.3
Deficit 0.1-4.9%	72	73.3	8.1	18.76	16.94	1.82	90.3
Surplus 0-4.9%	134	78.2	7.5	18.29	16.73	1.56	91.5
Surplus 5% or more ...	168	78.9	7.7	19.74	17.84	1.90	90.4
14-19 services	229	78.3	9.4	21.45	18.03	3.42	88.0
Deficit 5% or more ...	19	74.8	11.2	23.66	16.20	6.86	71.0
Deficit 0.1-4.9%	73	77.5	9.7	20.99	17.33	3.66	82.5
Surplus 0-4.9%	88	80.6	9.1	21.10	18.43	2.67	87.4
Surplus 5% or more ...	49	77.0	8.7	21.21	19.27	2.54	88.3
Number of services ^{2/} and deficit or surplus	Expense per patient day				Full-time personnel per 100 patients per day	Deficit-surplus as percent of expense	
	Total	Payroll	Other	Payroll as percent of total			
0-5 services	\$11.95	\$ 7.97	\$6.39	54.2	144	+ 5.8	
Deficit 5% or more ...	14.43	7.66	6.97	51.7	151	-10.9	
Deficit 0.1-4.9%	14.74	8.06	6.68	54.7	157	- 2.2	
Surplus 0-4.9%	13.90	7.41	6.49	53.3	140	+ 2.1	
Surplus 5% or more ...	13.69	7.97	6.12	55.3	142	+14.3	
6-9 services	16.01	8.80	7.21	55.0	163	+ 5.6	
Deficit 5% or more ...	17.69	9.43	8.26	53.3	170	-11.2	
Deficit 0.1-4.9%	15.91	8.20	7.31	52.9	157	- 1.6	
Surplus 0-4.9%	16.09	9.05	7.04	56.2	161	+ 2.3	
Surplus 5% or more ...	15.86	8.75	7.11	55.2	166	+12.6	
10-13 services	17.93	10.20	7.73	56.9	179	+ 5.4	
Deficit 5% or more ...	17.36	9.86	7.50	56.8	187	- 8.8	
Deficit 0.1-4.9%	19.12	11.02	8.10	57.6	192	- 1.9	
Surplus 0-4.9%	17.85	10.14	7.71	56.8	177	+ 2.5	
Surplus 5% or more ...	17.61	9.99	7.68	56.7	176	+12.1	
14-19 services	21.30	12.51	8.77	58.8	208	+ 0.7	
Deficit 5% or more ...	25.94	14.91	11.03	57.5	236	- 8.8	
Deficit 0.1-4.9%	21.30	12.56	8.74	59.0	211	- 1.4	
Surplus 0-4.9%	20.66	12.29	8.37	59.9	203	+ 2.1	
Surplus 5% or more ...	19.88	11.53	8.35	58.0	196	+ 9.7	

^{1/} Excludes Catholic and government hospitals.

^{2/} See table 8 for listing of services.

Table 12. Average rates for 1,515 nonprofit ^{1/} short-term general hospitals, by number of selected services and expense per patient day: 1951

Number of services ^{2/} and expense per patient day	Number of hospitals	Occupancy rate	Average length of stay (days)	Income per patient day			Patient as percent of total
				Total	Patient	Other	
0-5 services:							
Less than \$12.00	113	62.1	7.0	\$10.65	\$ 9.54	\$.71	93.4
\$12.00-\$15.99	120	60.7	6.0	14.56	13.73	.83	94.3
\$16.00-\$19.99	55	62.5	6.1	10.55	17.19	1.36	92.6
\$20.00 or more	21	60.7	5.0	24.72	22.75	1.97	92.0
6-9 services:							
Less than \$12.00	95	71.6	7.6	11.31	10.35	.96	91.5
\$12.00-\$15.99	245	71.8	7.0	14.04	13.67	1.17	92.1
\$16.00-\$19.99	142	71.5	6.8	18.60	17.49	1.19	93.6
\$20.00 or more	98	68.6	5.9	24.52	22.74	1.78	92.7
10-13 services:							
Less than \$12.00	25	77.5	8.3	11.03	10.20	1.63	86.2
\$12.00-\$15.99	124	78.1	8.1	15.04	13.69	1.25	90.3
\$16.00-\$19.99	134	77.6	7.8	18.72	17.32	1.40	92.5
\$20.00 or more	114	75.4	7.2	24.52	21.68	2.84	88.4
14-19 services:							
Less than \$12.00	3	85.1	10.0	12.04	10.59	1.45	87.9
\$12.00-\$15.99	43	77.9	9.6	14.84	13.00	1.76	88.1
\$16.00-\$19.99	66	78.3	9.2	18.53	16.06	2.47	85.6
\$20.00 or more	117	78.3	9.4	25.25	20.78	4.47	82.3
Number of services ^{2/} and expense per patient day	Expense per patient day				Payroll as percent of total	Full-time paid personnel per 100 patients per day	Deficit-surplus as percent of expense
	Total	Payroll	Other				
0-5 services:							
Less than \$12.00	\$ 9.81	\$ 5.32	\$4.49	54.3	117	+ 8.6	
\$12.00-\$15.99	13.83	7.40	6.43	53.5	144	+ 5.3	
\$16.00-\$19.99	17.22	9.71	8.11	54.5	166	+ 4.1	
\$20.00 or more	23.46	13.12	10.34	55.9	206	+ 5.4	
6-9 services:							
Less than \$12.00	10.19	5.31	4.88	52.1	132	+11.0	
\$12.00-\$15.99	14.05	7.68	6.37	54.7	151	+ 5.6	
\$16.00-\$19.99	17.72	9.71	8.01	54.8	178	+ 5.4	
\$20.00 or more	23.62	13.43	10.19	56.9	203	+ 3.8	
10-13 services:							
Less than \$12.00	10.56	5.50	5.06	52.1	126	+12.0	
\$12.00-\$15.99	14.25	7.80	6.45	54.8	160	+ 5.6	
\$16.00-\$19.99	17.86	10.21	7.65	57.2	181	+ 4.8	
\$20.00 or more	23.28	13.60	9.68	58.4	207	+ 5.3	
14-19 services:							
Less than \$12.00	11.36	5.57	5.79	49.0	123	+ 6.0	
\$12.00-\$15.99	14.50	7.93	6.57	54.7	170	+ 2.4	
\$16.00-\$19.99	18.21	10.41	7.80	57.2	193	+ 1.8	
\$20.00 or more	25.25	15.22	10.03	60.3	230	- 1/	

^{1/} Excludes Catholic and government hospitals.

^{2/} See table 8 for listing of services.

^{3/} Less than .05 percent.

The importance of the number of services as an explanatory factor in cost differentials among hospitals leads to an examination of the operating ratios for hospitals classified by number of services and (a) deficit or surplus (table 11) and (b) expense per patient day (table 12). Table 11 is similar to table 4, with number of services replacing number of hospital beds. Because of the high degree of association between hospital size and number of services, the variation in operating ratios in the two tables is about the same. When the number of services is held constant, hospitals with deficits are found to have low occupancy, long patient stay, low per diem income from patient sources, and high per diem expense.

Similarly table 12 can be compared with table 6. Among hospitals with a similar number of services, those with relatively high per diem expense tend to have low occupancy, short duration of stay, high income from all sources, a high percentage of expenditures absorbed by payroll, and a high ratio of personnel to patients.

Summary and Conclusions

The relationship between various characteristics of nonprofit short-term general hospitals and the level of expense per patient day as well as the presence and magnitude of deficits or surpluses is analyzed in this study. Ratios have been computed for hospitals that reported key financial items for 1951 on the Administrator's Guide questionnaire submitted to the American Hospital Association. Since the more important characteristics of hospitals are closely related to bed capacity and to the scope of the service program, the relationships were examined for groups of hospitals with similar bed capacities and with the same number of services.

As compared with small hospitals, the large hospitals show high occupancy rates, long duration of stay, high per diem income both from patients and from other sources, high expense per patient day for payroll and for other items, a large number of full-time personnel in relation to patients, and a less favorable financial balance. Furthermore, the proportion of total income derived from patients tends to be low and the proportion of total expense absorbed by payroll tends to be high in the large hospitals.

When the hospitals are classified by scope of program, as measured by 19 selected services, the several ratios vary with number of services in the same manner as with hospital size. The scope of program is obviously the most important factor affecting the level of per diem cost. In general, the hospitals which have low per diem costs are those which offer a limited number of services, although a high per diem expense does not assure the presence of a broad program. Because of the close relationship between number of services and size of hospital, bed capacity can be used as an indicator of the expected level of hospital cost.

One out of four hospitals has a deficit in income in relation to expense, deficits being relatively more prevalent among the larger hospitals. When bed capacity or number of services is held constant, the hospitals with deficits have low occupancy rates, long average duration of stay, low per diem patient income, high per diem expense (including both payroll and other items), and a high proportion of full-time personnel in relation to patients.

Nearly one-fourth of the hospitals spend \$20 or more per patient day; one-half of those in the largest size group have this high an expense rate. Among hospitals of comparable size or number of services, those with high expense show low occupancy rates, short duration of stay, high income per patient day (including income from patient sources and from other sources), a large number of employees in relation to patients, and a less favorable financial balance. When beds, number of services, and per diem expense are all held constant, the hospitals with deficits have low occupancy rates, long average duration of stay, and low per diem income from patients.

The function of a hospital is to provide service to the community in accordance with accepted medical practices. The provision of such service in the long run must be balanced by income. Faced with limited income a hospital has two alternatives: either to restrict its program or to operate at a deficit. Hospitals which provide a broad scope of service and therefore have high expenses incur a greater risk of deficit under present systems of hospital financing.

Since the level of per diem expense is closely related to the scope of the hospital service program, evaluation of costs in individual hospitals must take into account the nature of the program of services being offered. The attempt made in this paper to measure hospital service programs in relation to cost indicates that this type of measurement is feasible. More refined methods are needed to evaluate the cost in individual hospitals in relation to the scope of their programs.

