

*Hospital Use and Charges  
by Diagnostic Category*

*a report on the Indiana study of  
a Blue Cross population in 1956*

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*Research*  *Series 13*

**T**HE PROVISION OF HOSPITAL SERVICES has become a major activity in the United States, comparable to large industries in number of employees and dollars spent. Charges for these services have become a subject of considerable public debate. Yet sizeable gaps in our knowledge continue to exist—gaps which ought to be filled in the interests of intelligent planning and the formulation of public policy.

This study represents an attempt to supply needed information on this subject: the extent to which hospital use and charges result from specific diagnostic categories of illness conditions or injuries. It presents some findings of a 1956 study in Indiana of subscribers to one Blue Cross organization—the Blue Cross Hospital Service, Indianapolis, Indiana—and more specifically, of some 843,000 subscribers enrolled under one plan offered by that organization.

The measures selected for analysis to represent hospital use were admissions, average length of stay, and patient-days, while the following measures were employed to represent costs: average daily charges (room rate plus ancillary services), average bill per admission, and annual costs averaged over the total covered population—whether or not they were hospitalized.\* Age and sex, too, were important considerations in this analysis of hospital use and the charges associated with that use. The analysis was made not only for the total hospital experience of this population, but also for that part of it which was for surgery only.

### **Background and methods**

The data for this study were collected by Blue Cross Hospital Service from their claims records and tabulated on ledger sheets. The original analysis of these data was published in book form as: *Costs of Hospital Care in Indiana 1956*, by Harry Hineman, Actu-

\*Annual costs are hospital charges averaged over the total covered population and may be thought of in one sense as the cost to the community for hospital services.

arial Division, Blue Cross Hospital Service, Indianapolis, Indiana, January 1959. Subsequently, with the permission of this author and his organization, the ledger sheets were reworked by Health Information Foundation, and the results are presented here. A partial report on this study was published earlier by Health Information Foundation as: "Hospital Use and Charges by Diagnostic Category," *Progress in Health Services*, Vol. IX, No. 5, May 1960.

The population studied numbered 843,046 (see table), approximately one-fifth of the estimated population of Indiana at that time. It differed from the population of Indiana and the entire United States in 1956 in that it included a lower proportion of persons over age 50 (14.1 per cent against 23.2 in Indiana and 23.0 in the U.S.). The number of females in this population between the ages of 20 and 64 exceeded the number of males, but at 65 and over, unlike Indiana and the U.S., the reverse was true. These age and sex differences, and the lack of data about other characteristics of the study population, preclude generalization in any precise detail of the results of this analysis to the population of Indiana or to the entire U.S.

Study Population by Age and Sex—Indiana, 1956

Age group	Both sexes		Male	Female
	Number	Per cent		
All Ages	843,046	100.0	415,662	427,384
Under 20	339,974	40.3	174,985	164,989
20 - 34	201,843	23.9	91,868	109,975
35 - 49	183,033	21.7	89,274	93,759
50 - 64	95,681	11.4	47,097	48,584
65 and over	22,515	2.7	12,438	10,077

All persons in the study population had identical coverage under a specific plan—Blue Cross Comprehensive II Certificate of Membership. Enrollment was primarily through a group (826,000), while the remainder were group conversion (enrollees who were no longer eligible under their group plan, but who

wanted to continue their coverage).\* The latter included, among others, retired, unemployed, and self-employed persons and their dependents.

Persons insured under this plan were covered for a maximum of 120 days of hospital care per admission, with payment in full for all ancillary services. They were not covered for the extra charges for private rooms, blood and blood plasma, or hospital stays of over 30 days for pulmonary tuberculosis or mental disorder.\*\* The charges included in this study represent the total amount of the hospital bill for days covered by the Blue Cross contracts.†

All hospital admissions†† of this covered population during 1956 were included, except Workmen's Compensation cases and admissions for purely diagnostic reasons or X-ray therapy. The size of the population (including both enrollees and dependents) was determined from a membership list kept current by monthly additions or deletions and by periodic inventories, and age was obtained from a random sample of this population.

Finally, for the coding of diagnostic categories, in every case the technical discharge diagnosis on the claim form was translated by an experienced registered nurse employed by Blue Cross into the three-digit code of the *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death*, Sixth Revision, 1948, Vol. I. Because Health Information Foundation retabulated these data with somewhat different objectives from

\*Comprehensive Certificate II was available to groups and individuals as new members from 1950 through 1953. However, for convenience, the non-group enrollees were not included in the original tabulations since the cost structure was found to be identical to group conversion enrollment (when analyzed by age) and had about the same age distribution. Since 1954 group conversions were enrolled under a different plan of this organization, therefore, limiting their number in this study population.

\*\*Non-contract hospital days (over 120, or over 30 for pulmonary tuberculosis or mental disorder) were estimated by the administrative personnel of this plan not to exceed 1 per cent of the total days of hospital use in this experience.

†The hospital bills submitted to Blue Cross and analyzed here represent the amounts charged by hospitals for items included in the Blue Cross contract, plus some charges for items not included, such as blood and blood plasma, the private room differential, and certain personal non-health services or items. Hospitals were paid Blue Cross published charges for services included in the contract. In this experience the total amount of payments by Blue Cross added up to about 95 per cent of the total amount billed, leaving the out-of-pocket cost to the patient at about 5 per cent.

††The data in this study deal with admissions, not persons. Because of the way in which the data were originally tabulated, repeat admissions of the same person could not be determined.

those of the original sponsors, its procedures for grouping disease categories varied slightly from those of the Indiana Blue Cross with, therefore, some very minor differences in results.\*

### Hospital use

In the population studied here, there were 115.5 hospital admissions per 1,000 persons in 1956 (see Table 1). The most important major diagnostic category in this experience was obstetrical care,\*\* with 24.0 annual admissions per 1,000 (47.4 per 1,000 females), or one-fifth of the total (see Chart I). Most of these admissions consisted of deliveries, 20.1 per 1,000 (39.7 per 1,000 females).

The second most important major category for hospital admissions was respiratory diseases, 18.7 per 1,000. About three-fourths of these, 13.6 per 1,000, were upper respiratory (largely tonsillectomies and/or adenoidectomies), while the rate for pneumonia was 3.0. Digestive diseases followed closely behind respiratory, with 18.0 per 1,000. Other major diagnostic categories with high admission rates were genitourinary diseases, 14.1 per 1,000; circulatory diseases, 8.5; and accidental injuries, 7.2.

The average length of stay per admission was 7.3 days, but this average varied greatly among the diagnostic categories. Thus admissions for cancer averaged the longest duration of stay, 15.5 days per case; followed by mental disorders and early infancy diseases, with 15.2 and 14.8, respectively. At the other extreme, the shortest duration of stay among the major diagnostic categories was averaged by persons admitted for respiratory diseases, 3.4 days. (Upper respiratory was especially short, 1.9 days.) Persons admitted for obstetrical care, at 4.6 days, experienced next to the shortest length of stay per admission.

Admission rates and average duration of stay per admission together produce the total amount of hospital use. Among the

Table 1  
Selected Measures of Hospital Utilization and Costs, by Diagnostic Category  
Blue Cross Hospital Service, Indiana, 1956

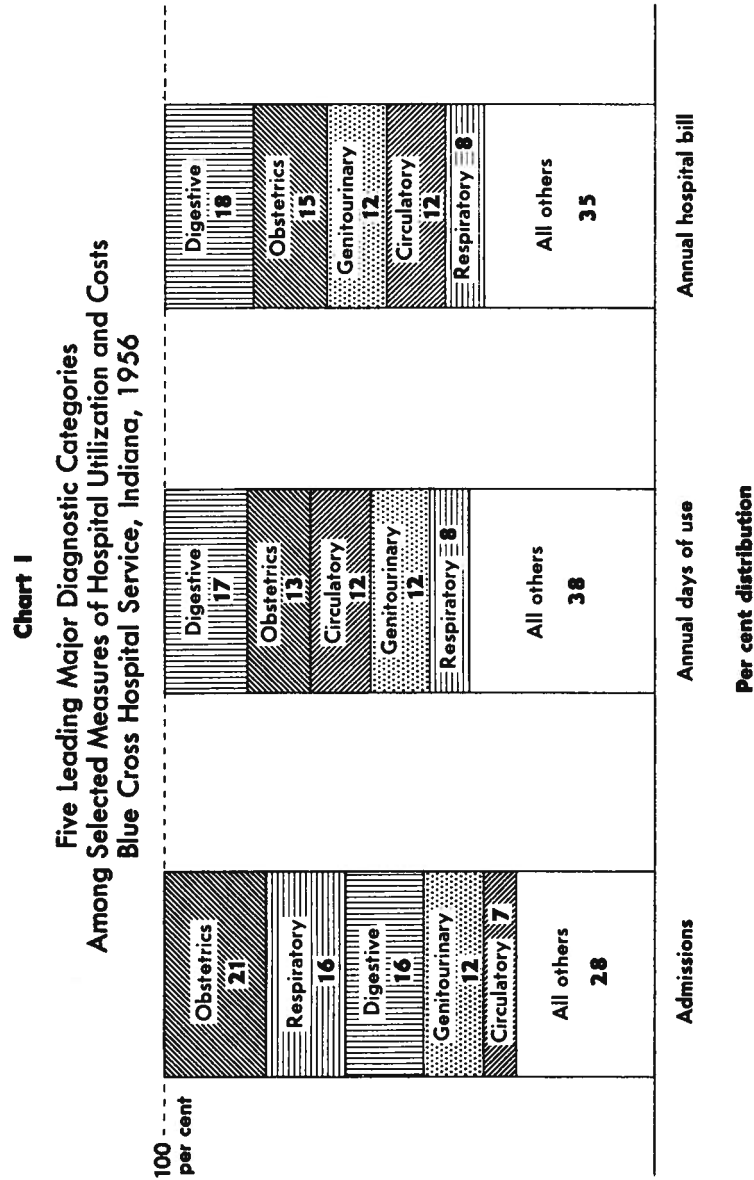
Major Categories & Sub-Categories of Diagnostic Conditions	ISC Code Numbers	Admissions per 1,000 population	Average length of stay (days)	Annual days per 1,000 population	Hospital bill per day	Hospital bill per admission	Annual hospital bill per 1,000 population
<b>ALL CATEGORIES</b>		<b>115.5</b>	<b>7.3</b>	<b>838.8</b>	<b>\$22.91</b>	<b>\$166</b>	<b>\$19,216</b>
<b>Infective and parasitic diseases</b>	<b>001-138</b>	<b>1.5</b>	<b>11.1</b>	<b>17.1</b>	<b>19.51</b>	<b>216</b>	<b>334</b>
Tuberculosis (all forms)	00-019	.3	17.4	4.4	14.79	258	66
Dysentery	045-048	.3	6.6	1.7	17.37	115	29
Acute poliomyelitis and its late effects	080-081	.2	17.7	3.9	21.53	382	84
<b>Malignant neoplasms (cancer)</b>	<b>140-205</b>	<b>2.3</b>	<b>15.5</b>	<b>36.2</b>	<b>25.01</b>	<b>387</b>	<b>905</b>
Of digestive organs and peritoneum	150-159	.4	19.5	7.9	25.78	503	204
Of respiratory system	160-165	.3	15.4	3.9	26.84	413	103
Of breast	170	.2	15.0	3.3	23.52	353	78
Of genitourinary organs	171-181	.7	13.4	9.1	24.34	327	221
<b>Benign and unspecified neoplasms</b>	<b>210-239</b>	<b>3.6</b>	<b>5.1</b>	<b>18.3</b>	<b>26.99</b>	<b>139</b>	<b>494</b>
<b>Allergic &amp; metabolic diseases</b>	<b>240-289</b>	<b>3.0</b>	<b>9.4</b>	<b>28.0</b>	<b>22.91</b>	<b>216</b>	<b>641</b>
Asthma	241	.7	7.1	5.0	23.53	167	117
Diseases of thyroid gland	250-254	8	8.2	6.3	24.80	204	156
Diabetes mellitus	260	1.1	12.3	13.3	22.03	271	293
<b>Diseases of the blood, etc.</b>	<b>290-299</b>	<b>.6</b>	<b>7.8</b>	<b>4.6</b>	<b>25.78</b>	<b>201</b>	<b>118</b>
<b>Mental disorders</b>	<b>300-326</b>	<b>1.6</b>	<b>15.2</b>	<b>25.0</b>	<b>18.87</b>	<b>288</b>	<b>472</b>
<b>Diseases of the nervous system</b>	<b>330-398</b>	<b>3.3</b>	<b>10.4</b>	<b>34.6</b>	<b>21.22</b>	<b>220</b>	<b>733</b>
Vascular lesions affecting CNS	330-334	.7	19.3	12.5	19.67	380	247
<b>Diseases of the circulatory system</b>	<b>400-468</b>	<b>8.5</b>	<b>12.0</b>	<b>102.3</b>	<b>22.04</b>	<b>264</b>	<b>2,254</b>
Diseases of heart	410-443	4.3	14.3	60.9	22.43	320	1,366
Arteriosclerotic & degenerative	420-422	2.5	15.3	38.7	22.63	347	876
Hypertension	440-447	.7	12.1	8.2	20.98	254	171
Hemorrhoids	461	2.2	8.0	17.5	21.29	170	373
<b>Diseases of the respiratory system</b>	<b>470-527</b>	<b>18.7</b>	<b>3.4</b>	<b>64.2</b>	<b>24.29</b>	<b>83</b>	<b>1,560</b>
Diseases of upper respiratory system	470-475-510-517	13.6	1.9	26.2	27.77	54	728
Influenza	480-483	.3	5.4	1.6	20.61	110	33
Pneumonia	490-493	3.0	7.8	23.1	20.99	163	486
Bronchitis	500-502	1.2	6.2	7.5	21.84	136	163
<b>Diseases of the digestive system</b>	<b>530-587</b>	<b>18.0</b>	<b>8.1</b>	<b>145.2</b>	<b>23.97</b>	<b>194</b>	<b>3,481</b>
Ulcer of stomach, duodenum & jejunum	540-542	2.3	9.5	21.8	25.37	240	553
Appendicitis	550-553	3.4	6.1	20.5	24.05	147	494
Hernia of abdominal cavity	560-561	3.1	7.1	22.1	22.23	157	491
Diseases of gallbladder	584-586	2.9	10.8	30.7	24.07	259	739
<b>Diseases of the genitourinary system</b>	<b>590-637</b>	<b>14.1</b>	<b>6.9</b>	<b>96.9</b>	<b>24.77</b>	<b>170</b>	<b>2,400</b>
Nephritis, chronic & unspecified, etc.	592-594	.1	11.4	1.5	23.31	266	36
Diseases of male genital organs	610-617	1.9	5.4	10.2	24.39	131	250
Diseases of female genital organs	620-637	7.9	7.0	55.4	24.54	172	1,360
<b>Obstetrical care</b>	<b>640-689</b>	<b>24.0</b>	<b>4.6</b>	<b>109.5</b>	<b>26.02</b>	<b>119</b>	<b>2,849</b>
Deliveries	660-678	20.1	4.8	96.7	26.35	127	2,549
Pre- and post-natal conditions	640-652-680-689	3.9	3.3	12.8	23.52	77	300
<b>Diseases of skin and cellular tissue</b>	<b>690-716</b>	<b>1.5</b>	<b>7.9</b>	<b>11.8</b>	<b>20.39</b>	<b>160</b>	<b>241</b>
<b>Diseases of the bones, etc.</b>	<b>720-749</b>	<b>3.6</b>	<b>10.4</b>	<b>37.9</b>	<b>22.37</b>	<b>233</b>	<b>848</b>
Arthritis	720-725	.8	11.8	9.1	22.51	265	204
<b>Congenital malformations</b>	<b>750-759</b>	<b>.7</b>	<b>11.2</b>	<b>8.0</b>	<b>18.95</b>	<b>212</b>	<b>152</b>
<b>Certain diseases of early infancy</b>	<b>760-776</b>	<b>1.9</b>	<b>14.8</b>	<b>27.6</b>	<b>8.12</b>	<b>120</b>	<b>224</b>
<b>Symptoms, senility, and ill-defined</b>	<b>780-795</b>	<b>1.3</b>	<b>6.8</b>	<b>8.6</b>	<b>23.64</b>	<b>161</b>	<b>204</b>
<b>Accidents, poisonings and violence</b>	<b>N800-N999</b>	<b>7.2</b>	<b>8.7</b>	<b>63.0</b>	<b>20.73</b>	<b>181</b>	<b>1,307</b>
Fractures and dislocations	N800-N839	3.0	13.2	40.0	19.98	263	799
Other injuries	N840-N999	4.2	5.5	23.1	22.03	122	508

Note: Applies only to persons enrolled under Blue Cross Comprehensive II Certificate of Membership. For methods and all other qualifications to the data, see text.

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\*For a full discussion of methods used in the original study and of qualifications to these data, see the report by H. Hineman, *op. cit.*

\*\*For convenience in presentation, the titles of diagnostic categories used in the text of this report represent, wherever possible, shortened versions of the fuller titles used in Table 1. In turn, some of the titles in that table also are shortened versions of the complete titles listed in the *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death*, Sixth Revision, 1948, Vol. I.



Note: Same as Table 1.

enrollees in this plan total use of hospital services averaged 838.8 days per 1,000 persons annually (about 0.8 days per person).\* Somewhat over one-sixth of the total, 145.2 days, was due to digestive diseases. The next largest major category was obstetrical care, 109.5 days. Most of this—96.7 days of annual use—was due to deliveries. Also important among the major categories were circulatory diseases, 102.3 days; genitourinary diseases, 96.9; and respiratory diseases, 64.2.

**The hospital bill**

The bill submitted by hospitals to Blue Cross for this enrolled population averaged \$22.91 for each in-patient hospital day. This amount included both the room rate and the costs of the various ancillary services performed in the hospital.\*\* Here again, the size of the bill rendered by the hospital for each day of use varied according to the diagnosis; very often the average cost per day was high for diagnoses involving a short stay and low where the stay was long.

Among the major diagnostic categories, the average hospital bill per day was highest where the admission was for benign neoplasms, \$26.99. The next highest was for obstetrical care, \$26.02. Among the sub-categories analyzed here, upper respiratory averaged the top figure at \$27.77. Each of these diagnoses was characterized by a low average duration of stay.

\*The admission rate, average duration of stay, and annual days of use in this study were reasonably similar to the results reported in a household survey of a national sample of the civilian noninstitutional population of the United States: 99.4 discharges per 1,000 persons, (115.5 in this study) 8.6 days average length of stay (7.3), and 851.2 annual patient-days per 1,000 population (838.8). U. S. National Health Survey, "Hospitalization: Patients Discharged from Short-Stay Hospitals, United States, July 1957-June 1958," Series B-7, Washington, D. C., 1958. See also: Health Information Foundation, "Trends in Use of General Hospitals," *Progress in Health Services*, Vol. VIII, No. 8, October 1959.

The somewhat higher admission rate in this study than in the National Health Survey was due to factors other than the age and sex composition of this Indiana Blue Cross population. Thus, even when the age and sex composition of the study population was adjusted to the 1957 population of the United States its admission rate was not substantially changed from the unadjusted rate.

\*\*For room rates alone, the average charge in Indiana in 1956 for a two-bed room was \$11.43, according to the American Hospital Association's annual survey on hospital rates. This placed Indiana just below the national average two-bed room rate of \$12.16 for that year. By state, this average room rate ranged from \$17.93 to \$7.84. The average per diem reimbursable cost (as computed under the government reimbursable cost formula) for Indiana was \$20.54, about the same as for the entire U. S., \$20.52. This reimbursable cost figure is directly reflected in the charges made by hospitals as analyzed in this report, which may be assumed to be at about average for the country.

At the other extreme, the lowest average daily bill, \$8.12, among the major diagnostic categories was for diseases of early infancy.\* The next lowest average cost per day, \$18.87, was for mental disorders, followed closely by \$18.95 for congenital malformations and \$19.51 for the infective and parasitic diseases. Among the sub-categories here, tuberculosis averaged lowest at \$14.79.

For the entire duration of stay in each admission, the average cost amounted to \$166. Admission for cancer was the most expensive among the major diagnostic categories, averaging \$387 per admission. Especially high was digestive cancer, which totaled \$503 per admission, followed by respiratory cancer at \$413. High costs per admission for cancer were due both to high costs per day and long average durations of stay per admission. Mental disorders were next highest among the major diagnoses in costs per admission, \$288, primarily because their average duration of stay was long.

Among the relatively common diagnoses on admission, deliveries averaged \$127 per admission; upper respiratory diseases, \$54; diseases of the female genital organs, \$172; appendicitis, \$147; and hernia, \$157. Others of general interest were poliomyelitis, \$382; vascular lesions, \$380; asthma, \$167; and arthritis, \$265.

Averaged over the entire covered population—including both those who used hospital services and those who did not—the total hospital bill amounted to \$19,216 per 1,000 persons, or \$19.22 per person.\*\* Just over one-sixth of the total was due to the digestive diseases, \$3,481 per 1,000 (\$3.48 per person). Admissions for obstetrical care were next among the major categories at \$2,849 per 1,000. Other important major diagnostic categories were genitourinary diseases, \$2,400; circulatory diseases, \$2,254; respiratory diseases, \$1,560; accidental injuries, \$1,307; and cancer, \$905.

\*This low rate reflects the hospitals' methods of charging for the newborn (i.e., the charge for the nursery is probably less than the room rate).

\*\*This figure for 1956 corresponds closely to the average annual expenditure on hospital services of \$22 in 1957-58 reported in a household survey of a national sample of the U. S. population. Health Information Foundation, "Our Increased Spending for Health," *Progress in Health Services*, Vol. IX, No. 2, February 1960.

### Age and sex for all diagnoses

Hospital admissions varied substantially among the age and sex groups comprising this enrolled population. Women aged 20-34 (the main childbearing ages) experienced the highest rate, 245.6 per 1,000 (see Table 2), more than double the average admission rate of 115.5 per 1,000 for all subscribers.

However, when admissions for obstetrical care were excluded from this comparison, the age pattern of hospital admissions was considerably different. From 77.8 per 1,000 at ages under 20 (see Chart II), the admission rates for both sexes dropped slightly to 70.3 at 20-34, but thereafter they rose steadily as age increased to a peak of 220.3 per 1,000 at ages 65 and over.

With obstetrical care included, the admission rate for women aged 20 and over,\* 191.1 per 1,000, exceeded the comparable male rate, 86.3, by as much as 125 per cent. Even with obstetrical care omitted, the female rate at ages 20 and over exceeded the male by about one-third. This female excess existed at each of the adult age groups, but was relatively largest—some 69 per cent—at ages 35-49 (obstetrics excluded).

Age and sex of the population among these enrollees influenced not merely admission rates, but also average duration of stay. Thus from 5.1 days at under age 20, average duration of stay per admission rose to 14.7 days at 65 and over. With obstetrical care excluded, the figure for average duration of stay for persons aged 20-34 rose from 5.5 to 6.8 days, but the pattern of continuing increase with age remained basically unchanged.

For adults 20 and over the average stay for males, 9.7 days, exceeded that for females, 7.4, by almost one-third. However, with obstetrical care excluded the relative male excess was only 4 per cent. At 65 and over the average duration of stay for females, 15.6 days, exceeded that for males, 14.1 days, by about 10 per cent.

The amount of annual hospital use also rose sharply with age. From 395.2 for persons under 20 (see Chart III), annual days of

\*Because of the way in which the data were originally tabulated, information is unavailable for each sex separately under age 20. Any total for all males or females applies to ages 20 and over only.

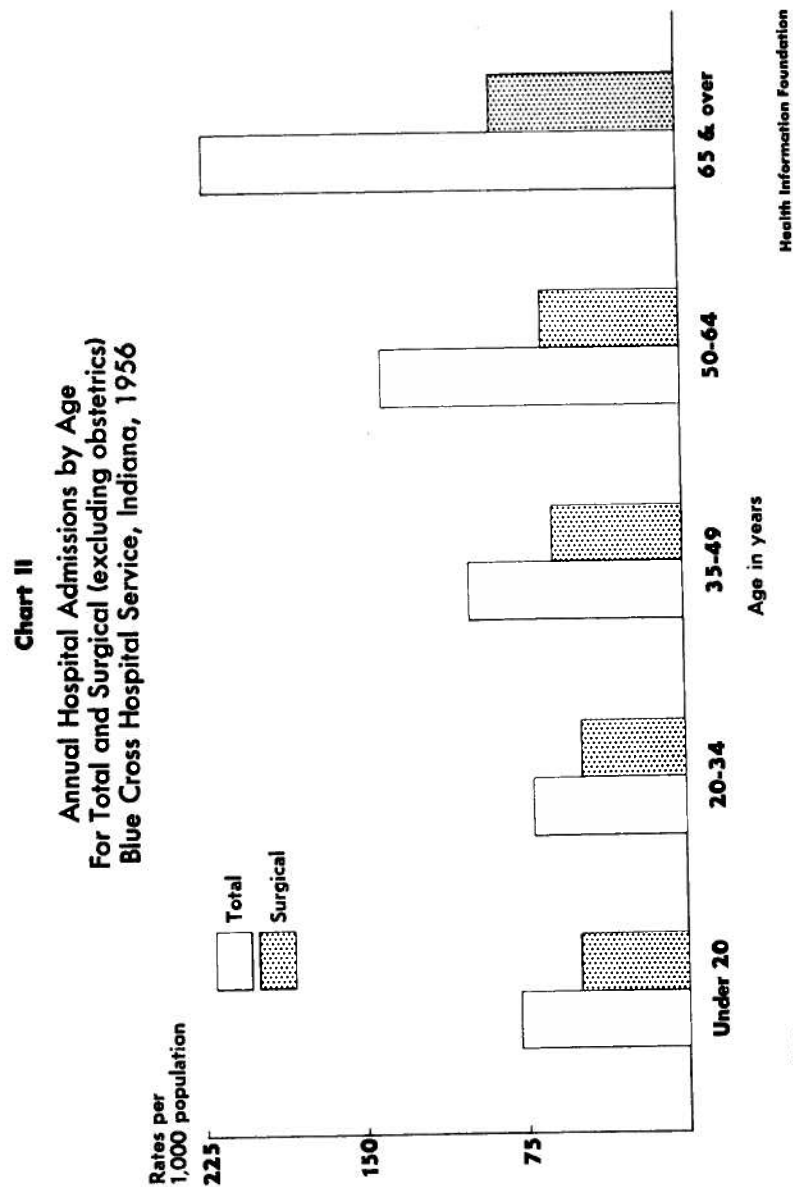
Table 2

**Selected Measures of Hospital Utilization and Costs, by Age and Sex  
Blue Cross Hospital Service, Indiana, 1956**

Age and Sex	Admissions per 1,000 population	Average length of stay (days)	Annual days per 1,000 population	Hospital bill per day	Hospital bill per admission	Annual hospital bill per 1,000 population
<b>ALL AGES</b>						
Both Sexes	115.5	7.3	838.8	\$22.91	\$166	\$19,216
<b>Under 20 years</b>						
Both Sexes	77.8	5.1	395.2	19.53	99	7,720
<b>Over 20</b>						
Both Sexes—Total	141.0	8.1	1,138.6	23.70	191	26,985
Excluding obstetrics	100.8	9.5	955.3	23.26	220	22,216
Male	86.3	9.7	841.7	23.42	228	19,713
Female—Total	191.1	7.4	1,410.9	23.85	176	33,655
Excluding obstetrics	114.0	9.3	1,059.5	23.13	215	24,511
<b>20-34</b>						
Both Sexes—Total	159.0	5.5	876.7	24.70	136	21,658
Excluding obstetrics	70.3	6.8	478.1	23.66	161	11,310
Male	55.4	6.9	383.4	23.50	163	9,009
Female—Total	245.6	5.2	1,288.9	25.00	131	32,224
Excluding obstetrics	82.8	6.7	557.3	23.75	160	13,233
<b>35-49</b>						
Both Sexes—Total	112.6	8.4	940.4	24.03	201	22,599
Excluding obstetrics	99.9	8.8	876.6	23.86	209	20,912
Male	73.9	8.5	627.9	24.02	204	15,080
Female—Total	149.4	8.3	1,237.8	24.04	199	29,758
Excluding obstetrics	124.8	8.9	1,113.4	23.77	212	26,466
<b>50-64</b>						
Both Sexes	138.7	11.3	1,573.4	23.03	261	36,240
Male	135.5	11.4	1,551.3	23.38	268	36,262
Female	141.7	11.3	1,594.8	22.71	256	36,219
<b>65 and over</b>						
Both Sexes	220.4	14.7	3,249.9	21.87	322	71,070
Male	218.4	14.1	3,074.3	22.56	318	69,364
Female	222.8	15.6	3,466.6	21.11	328	73,175

Note. Same as Table 1.

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Note. Same as Table 1.

use per 1,000 rose to 1,573.4 at ages 50-64 and to more than double that amount, 3,249.9, at 65 and over (an average of 3¼ days per person). Annual days of use by females exceeded that for males at all adult ages.

The average bill for each in-patient hospital day was considerably lower at ages under 20, \$19.53, than at 20 and over, \$23.70. At the adult ages it actually declined slightly as age increased, from \$24.70 at 20-34 to \$21.87 at 65 and over.

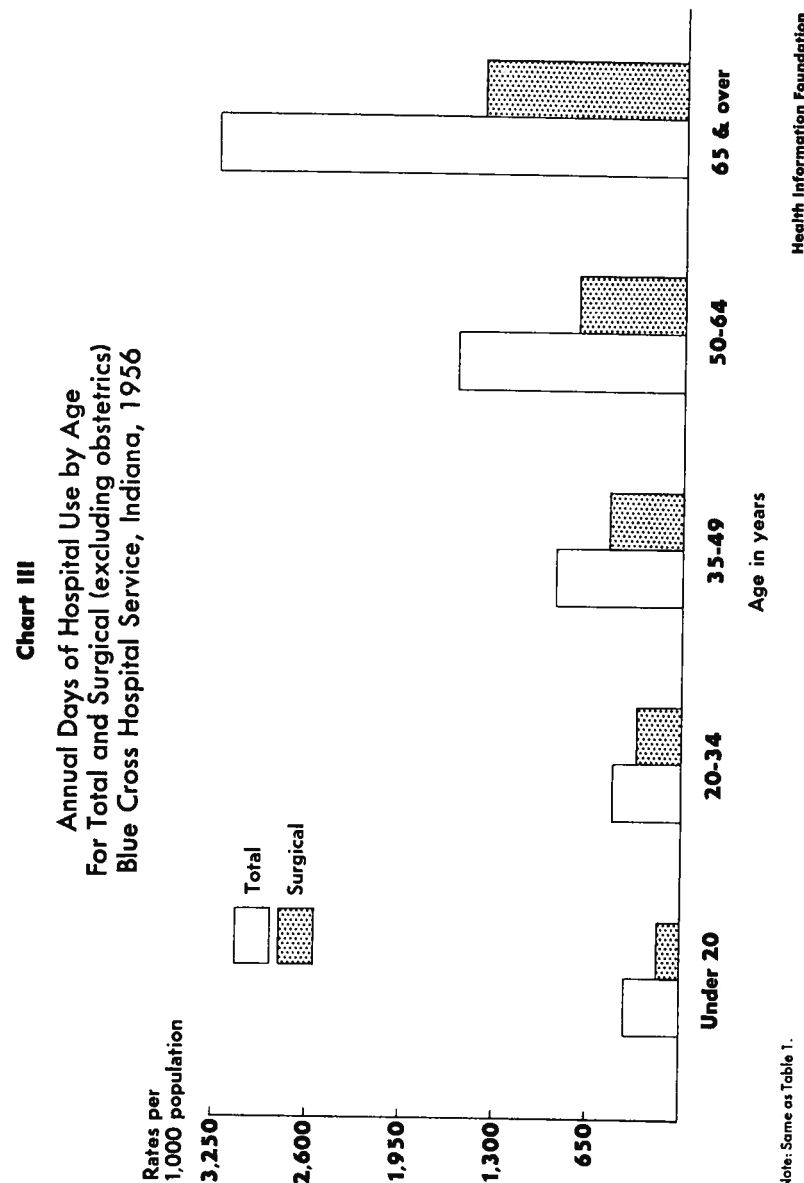
For adults aged 20 and over the average amount was slightly higher among females, \$23.85, against \$23.42 for males. However, with obstetrical care (high average charges per day) excluded, the average charge per day for females was slightly lower at \$23.13. At ages 65 and over the average charge per day for males, \$22.56, was considerably in excess of that for females, \$21.11.

For the total duration of stay in each admission, the average charges too were lowest at ages under 20, \$99, and nearly double that figure for adults over 20, \$191. The bill per admission increased steadily as age increased, reaching \$322 at 65 and over.

At the adult ages, the total charges per admission averaged higher for males than females, \$228 against \$176. However, with obstetrical care (lower charges per admission than the average for all admissions) excluded, the average charge per admission for females, \$215, was much closer to that for males.

Again, averaged over the entire covered population and thus including those who used services as well as those who did not, the total annual hospital bill amounted to a low figure, \$7,720 per 1,000 (\$7.72 per person) under age 20, and was much higher for adults over 20, \$26,985 per 1,000 (\$26.99 per person). The average rose with age and reached \$71,070 at 65 and over (\$71.07 per person).

The amount was higher for females over 20, \$33,655, against \$19,713 for males. But this difference was much less with obstetrical care excluded—the total hospital bill for females over 20 was down to \$24,511 per 1,000 annually. At 65 and over the figure was





only slightly higher for females, \$73,175 per 1,000 annually against \$69,364 for males.

### Leading diagnoses at each age group

The impact of the major diagnostic categories of illness and injury on hospital admissions, total annual use, and total annual charges varied substantially according to the age group of the enrolled population. Each stage of the life-cycle is peculiarly subject to its own hazards. Thus at ages under 20, respiratory disease (mainly upper respiratory, and especially tonsillectomies and/or adenoidectomies) was the leading diagnostic category; at 20-34 obstetrical care far outdistanced the others; at 35-49 and 50-64 it was the digestive diseases and at 65 and over the circulatory diseases. In each instance (except one) the same diagnostic category led at each age group on all three measures—admissions, use, and total charges.\*

At ages under 20, respiratory diseases accounted for 34.0 admissions per 1,000 population (see Table 3), or some 44 per cent of all admissions in this age group. However, because its average length of stay per admission, 2.5 days, was about half the average for all admissions, its total annual days of hospital use, 86.3 per 1,000, constituted only 22 per cent of total hospital use by persons at these ages. The annual hospital bill for respiratory diseases amounted to \$2,136 per 1,000 persons in this age group, 28 per cent of the total for all diagnostic categories. Other leading major diagnostic categories under 20 were the digestive diseases and accidental injuries, diseases of early infancy and the genitourinary diseases.

At ages 20-34 obstetrical care dominated the hospital picture. It ranked first in admissions, use, and annual charges, far exceeding the other diagnostic categories. Its 88.7 annual admissions per 1,000 population (see Table 4) constituted 56 per cent of all hospital admissions at these ages; its 398.6 annual days of hospital use per 1,000 was 45 per cent of the total use; and its annual hospital bill of \$10,348 per 1,000 population was 48 per cent of the total bill in this age group.

\*The exception was at ages 50-64, where the digestive diseases ranked first for admissions and total charges, but the circulatory diseases were first for annual days of use.

Table 3

Selected Measures of Hospital Utilization and Costs for Ages Under 20  
By Diagnostic Category, Blue Cross Hospital Service, Indiana, 1956

Major Categories & Sub-Categories of Diagnostic Conditions	ISC Code Numbers	Admissions per 1,000 population	Average length of stay (days)	Annual days per 1,000 population	Hospital bill per day	Hospital bill per admission	Annual hospital bill per 1,000 population
<b>ALL CATEGORIES</b>		<b>77.8</b>	<b>5.1</b>	<b>395.2</b>	<b>\$19.53</b>	<b>\$99</b>	<b>\$7,720</b>
<b>Infective and parasitic diseases</b>	<b>001-138</b>	<b>2.2</b>	<b>9.6</b>	<b>20.9</b>	<b>19.46</b>	<b>186</b>	<b>406</b>
Tuberculosis (all forms)	001-019	.1	19.1	1.9	15.98	305	31
Dysentery	045-048	5	6.7	3.6	16.20	109	58
Acute poliomyelitis and its late effects	080-081	.4	17.0	7.4	19.71	336	146
<b>Malignant neoplasms (cancer)</b>	<b>140-205</b>	<b>.3</b>	<b>12.8</b>	<b>3.7</b>	<b>24.27</b>	<b>312</b>	<b>89</b>
Of digestive organs and celluloseum	150-159	.0	10.0	.1	22.82	228	3
Of respiratory system	60-165	.0	6.5	0	38.00	247	1
Of breast	170	.0	47.0	.1	21.17	995	3
Of genitourinary organs	171-181	.0	13.3	3	27.14	360	8
<b>Benign and unspecified neoplasms</b>	<b>210-239</b>	<b>1.6</b>	<b>4.0</b>	<b>6.4</b>	<b>25.90</b>	<b>104</b>	<b>165</b>
<b>Allergic &amp; metabolic diseases</b>	<b>240-289</b>	<b>1.2</b>	<b>6.7</b>	<b>7.8</b>	<b>21.19</b>	<b>142</b>	<b>166</b>
Asthma	241	.6	5.2	3.2	21.89	113	70
Diseases of thyroid gland	250-254	.1	5.9	.5	23.08	136	11
Diabetes mellitus	260	2	10.9	2.3	20.38	223	48
<b>Diseases of the blood, etc.</b>	<b>290-299</b>	<b>.7</b>	<b>6.4</b>	<b>4.3</b>	<b>22.71</b>	<b>145</b>	<b>97</b>
<b>Mental disorders</b>	<b>300-326</b>	<b>.2</b>	<b>15.7</b>	<b>3.2</b>	<b>15.12</b>	<b>237</b>	<b>49</b>
<b>Diseases of the nervous system</b>	<b>330-398</b>	<b>2.4</b>	<b>6.1</b>	<b>14.7</b>	<b>22.07</b>	<b>135</b>	<b>324</b>
Vascular lesions affecting CNS	330-334	1	15.2	8	24.22	368	18
<b>Diseases of the circulatory system</b>	<b>400-468</b>	<b>1.1</b>	<b>9.3</b>	<b>10.4</b>	<b>19.72</b>	<b>182</b>	<b>206</b>
Diseases of heart	410-443	.2	8.4	1.8	23.19	195	41
Arteriosclerotic & degenerative	420-422	.0	5.8	.1	21.46	123	3
Hypertension	440-447	0	11.8	3	20.58	242	6
Hemorrhoids	461	0	7.5	.2	20.41	154	5
<b>Diseases of the respiratory system</b>	<b>470-527</b>	<b>34.0</b>	<b>2.5</b>	<b>86.3</b>	<b>24.75</b>	<b>63</b>	<b>2,136</b>
Diseases of upper respiratory system	470-475 500-517	27.3	1.6	44.1	29.03	47	1,283
Influenza	480-483	3	4.8	1.3	19.00	91	25
Pneumonia	490-493	4.4	6.7	29.1	19.68	131	573
Bronchitis	500-502	1.8	5.5	9.7	21.69	119	209
<b>Diseases of the digestive system</b>	<b>530-587</b>	<b>11.2</b>	<b>5.5</b>	<b>61.5</b>	<b>21.52</b>	<b>118</b>	<b>1,324</b>
Ulcer of stomach, duodenum & jejunum	540-542	3	8.8	2.3	21.67	190	50
Appendicitis	550-553	4.0	5.4	21.2	23.13	124	490
Hernia of abdominal cavity	560-561	2.7	4.2	11.1	22.89	96	254
Diseases of gallbladder	584-586	.2	7.2	1.7	21.29	153	35
<b>Diseases of the genitourinary system</b>	<b>590-637</b>	<b>5.1</b>	<b>4.3</b>	<b>22.1</b>	<b>22.36</b>	<b>97</b>	<b>493</b>
Nephritis, chronic & unspecified, etc.	592-594	.1	11.7	1.2	18.51	217	22
Diseases of male genital organs	610-617	2.2	1.2	2.7	24.97	31	67
Diseases of female genital organs	620-637	1.1	5.8	6.3	23.09	135	145
<b>Obstetrical care</b>	<b>640-689</b>	<b>.1</b>	<b>6.0</b>	<b>.3</b>	<b>21.18</b>	<b>127</b>	<b>7</b>
Deliveries	660-678	0	5.1	.2	22.48	114	5
Pre- and post-natal conditions	640-652: 680-689	0	9.3	.1	18.68	173	2
<b>Diseases of skin and cellular tissue</b>	<b>690-716</b>	<b>1.4</b>	<b>6.5</b>	<b>9.0</b>	<b>18.78</b>	<b>122</b>	<b>168</b>
<b>Diseases of the bones, etc.</b>	<b>720-749</b>	<b>1.2</b>	<b>8.0</b>	<b>9.5</b>	<b>20.99</b>	<b>168</b>	<b>199</b>
Arthritis	720-725	.1	8.6	1.0	22.47	194	22
<b>Congenital malformations</b>	<b>750-759</b>	<b>1.7</b>	<b>11.2</b>	<b>18.7</b>	<b>18.60</b>	<b>209</b>	<b>349</b>
<b>Certain diseases of early infancy</b>	<b>760-776</b>	<b>4.6</b>	<b>14.9</b>	<b>68.2</b>	<b>8.07</b>	<b>120</b>	<b>550</b>
<b>Symptoms, senility, and ill-defined</b>	<b>780-795</b>	<b>1.2</b>	<b>4.8</b>	<b>5.7</b>	<b>21.36</b>	<b>102</b>	<b>122</b>
<b>Accidents, poisonings and violence</b>	<b>N800-N999</b>	<b>7.8</b>	<b>5.4</b>	<b>42.6</b>	<b>20.42</b>	<b>111</b>	<b>871</b>
Fractures and dislocations	N800-N839	2.8	8.0	22.6	19.81	158	448
Other injuries	N840-N999	5.0	4.0	20.0	21.12	84	423

Note: Same as Table 1.

Health Information Foundation

Table 4

**Selected Measures of Hospital Utilization and Costs for Ages 20-34  
By Diagnostic Category, Blue Cross Hospital Service, Indiana, 1956**

Major Categories & Sub-Categories of Diagnostic Conditions	ISC Code Numbers	Admissions per 1,000 population	Average length of stay (days)	Annual days per 1,000 population	Hospital bill per day	Hospital bill per admission	Annual hospital bill per 1,000 population
<b>ALL CATEGORIES</b>		<b>159.0</b>	<b>5.5</b>	<b>876.7</b>	<b>\$24.70</b>	<b>\$136</b>	<b>\$21,658</b>
<b>Infective and parasitic diseases</b>	<b>001-138</b>	<b>1.1</b>	<b>12.1</b>	<b>13.2</b>	<b>21.72</b>	<b>264</b>	<b>287</b>
Tuberculosis (all forms)	001-019	.2	17.9	3.4	13.40	239	45
Dysentery	045-048	.1	5.9	.4	26.70	158	10
Acute poliomyelitis and its late effects	080-081	.1	22.8	3.3	28.29	646	93
<b>Malignant neoplasms (cancer)</b>	<b>140-205</b>	<b>.7</b>	<b>11.9</b>	<b>8.0</b>	<b>26.47</b>	<b>315</b>	<b>211</b>
Of digestive organs and peritoneum	150-159	.0	18.4	.8	21.96	405	18
Of respiratory system	160-165	.0	13.6	.3	26.71	363	9
Of breast	170	.1	7.6	.5	26.36	201	14
Of genitourinary organs	171-181	.2	11.1	2.2	23.53	261	52
<b>Benign and unspecified neoplasms</b>	<b>210-239</b>	<b>4.1</b>	<b>4.4</b>	<b>18.2</b>	<b>26.60</b>	<b>118</b>	<b>483</b>
<b>Allergic &amp; metabolic diseases</b>	<b>240-289</b>	<b>2.1</b>	<b>7.4</b>	<b>15.8</b>	<b>23.99</b>	<b>177</b>	<b>379</b>
Asthma	241	.2	5.6	1.3	23.65	133	30
Diseases of thyroid gland	250-254	.9	6.5	5.8	24.40	159	142
Diabetes mellitus	260	.6	9.6	5.6	23.86	230	133
<b>Diseases of the blood, etc.</b>	<b>290-299</b>	<b>.3</b>	<b>7.2</b>	<b>2.4</b>	<b>31.09</b>	<b>225</b>	<b>73</b>
<b>Mental disorders</b>	<b>300-326</b>	<b>2.2</b>	<b>14.2</b>	<b>31.0</b>	<b>18.90</b>	<b>268</b>	<b>586</b>
<b>Diseases of the nervous system</b>	<b>330-398</b>	<b>1.9</b>	<b>7.8</b>	<b>14.5</b>	<b>23.08</b>	<b>181</b>	<b>335</b>
Vascular lesions affecting CNS	330-334	.1	17.3	1.9	20.15	348	38
<b>Diseases of the circulatory system</b>	<b>400-468</b>	<b>4.3</b>	<b>8.3</b>	<b>35.6</b>	<b>22.55</b>	<b>187</b>	<b>803</b>
Diseases of heart	410-443	.7	11.0	7.4	24.34	268	179
Arteriosclerotic & degenerative	420-422	.3	10.0	2.7	24.51	246	67
Hypertension	440-447	.1	7.3	.8	21.23	154	18
Hemorrhoids	461	2.3	7.3	16.6	20.70	150	343
<b>Diseases of the respiratory system</b>	<b>470-527</b>	<b>8.6</b>	<b>3.6</b>	<b>31.1</b>	<b>25.61</b>	<b>93</b>	<b>798</b>
Diseases of upper respiratory system	470-475:510-517	6.3	2.5	15.6	26.87	66	420
Influenza	480-483	.3	4.4	1.1	23.69	104	26
Pneumonia	490-493	1.0	7.5	7.2	22.35	168	161
Bronchitis	500-502	.4	5.3	2.1	22.95	121	48
<b>Diseases of the digestive system</b>	<b>530-587</b>	<b>15.1</b>	<b>7.0</b>	<b>105.2</b>	<b>23.84</b>	<b>166</b>	<b>2,509</b>
Ulcer of stomach, duodenum & jejunum	540-542	2.0	7.5	14.9	24.12	182	358
Appendicitis	550-553	4.5	5.9	26.8	24.22	143	649
Hernia of abdominal cavity	560-561	2.0	7.3	14.3	21.84	160	313
Diseases of gallbladder	584-586	2.3	9.0	20.5	23.52	213	482
<b>Diseases of the genitourinary system</b>	<b>590-637</b>	<b>18.1</b>	<b>5.9</b>	<b>106.9</b>	<b>24.81</b>	<b>146</b>	<b>2,652</b>
Nephritis, chronic & unspecified, etc.	592-594	.1	9.7	1.1	27.72	268	32
Diseases of male genital organs	610-617	1.0	3.8	3.7	25.59	98	95
Diseases of female genital organs	620-637	12.9	6.1	79.1	24.06	147	1,903
<b>Obstetrical care</b>	<b>640-689</b>	<b>88.7</b>	<b>4.5</b>	<b>398.6</b>	<b>25.96</b>	<b>117</b>	<b>10,348</b>
Deliveries	660-678	74.8	4.7	354.4	26.33	125	9,330
Pre- and post-natal conditions	640-652:680-689	13.9	3.2	44.2	23.01	73	1,018
<b>Diseases of skin and cellular tissue</b>	<b>690-716</b>	<b>1.5</b>	<b>7.4</b>	<b>10.9</b>	<b>21.34</b>	<b>158</b>	<b>233</b>
<b>Diseases of the bones, etc.</b>	<b>720-749</b>	<b>3.5</b>	<b>8.7</b>	<b>30.4</b>	<b>23.05</b>	<b>201</b>	<b>701</b>
Arthritis	720-725	.4	10.9	4.2	22.17	243	94
<b>Congenital malformations</b>	<b>750-759</b>	<b>.1</b>	<b>10.6</b>	<b>1.4</b>	<b>23.61</b>	<b>250</b>	<b>33</b>
<b>Certain diseases of early infancy</b>	<b>760-776</b>	<b>.0</b>	<b>6.9</b>	<b>.3</b>	<b>18.12</b>	<b>125</b>	<b>6</b>
<b>Symptoms, senility, and ill-defined</b>	<b>780-795</b>	<b>.9</b>	<b>6.3</b>	<b>5.9</b>	<b>24.77</b>	<b>156</b>	<b>147</b>
<b>Accidents, poisonings and violence</b>	<b>N800-N999</b>	<b>5.8</b>	<b>8.1</b>	<b>47.2</b>	<b>22.75</b>	<b>184</b>	<b>1,074</b>
Fractures and dislocations	N800-N839	2.1	11.7	24.8	22.11	258	548
Other injuries	N840-N999	3.7	6.0	22.4	23.46	142	526

Note: Same as Table 1.

Health Information Foundation

Table 5

**Selected Measures of Hospital Utilization and Costs for Ages 35-49  
By Diagnostic Category, Blue Cross Hospital Service, Indiana, 1956**

Major Categories & Sub-Categories of Diagnostic Conditions	ISC Code Numbers	Admissions per 1,000 population	Average length of stay (days)	Annual days per 1,000 population	Hospital bill per day	Hospital bill per admission	Annual hospital bill per 1,000 population
<b>ALL CATEGORIES</b>		<b>112.6</b>	<b>8.4</b>	<b>940.4</b>	<b>\$24.03</b>	<b>\$201</b>	<b>\$22,599</b>
<b>Infective and parasitic diseases</b>	<b>001-138</b>	<b>1.0</b>	<b>12.7</b>	<b>12.1</b>	<b>18.50</b>	<b>235</b>	<b>224</b>
Tuberculosis (all forms)	001-019	.3	17.3	5.3	13.56	234	72
Dysentery	045-048	.1	6.3	.3	23.43	148	8
Acute poliomyelitis and its late effects	080-081	.0	12.7	.6	22.49	285	14
<b>Malignant neoplasms (cancer)</b>	<b>140-205</b>	<b>3.1</b>	<b>13.8</b>	<b>42.9</b>	<b>26.49</b>	<b>365</b>	<b>1,137</b>
Of digestive organs and peritoneum	150-159	.4	17.7	6.5	28.11	499	183
Of respiratory system	160-165	.3	13.8	3.7	27.03	373	100
Of breast	170	.4	14.1	6.2	24.05	340	149
Of genitourinary organs	171-181	1.1	12.0	13.2	26.10	314	345
<b>Benign and unspecified neoplasms</b>	<b>210-239</b>	<b>5.9</b>	<b>5.2</b>	<b>30.9</b>	<b>27.76</b>	<b>144</b>	<b>857</b>
<b>Allergic &amp; metabolic diseases</b>	<b>240-289</b>	<b>4.2</b>	<b>9.1</b>	<b>38.2</b>	<b>24.03</b>	<b>219</b>	<b>919</b>
Asthma	241	.8	7.6	6.1	25.62	196	155
Diseases of thyroid gland	250-254	1.6	9.0	14.3	24.92	225	356
Diabetes mellitus	260	1.2	10.4	12.7	23.32	243	295
<b>Diseases of the blood, etc.</b>	<b>290-299</b>	<b>.4</b>	<b>8.9</b>	<b>3.8</b>	<b>26.92</b>	<b>238</b>	<b>102</b>
<b>Mental disorders</b>	<b>300-326</b>	<b>3.0</b>	<b>14.9</b>	<b>44.1</b>	<b>18.74</b>	<b>279</b>	<b>826</b>
<b>Diseases of the nervous system</b>	<b>330-398</b>	<b>3.1</b>	<b>10.3</b>	<b>32.5</b>	<b>22.46</b>	<b>232</b>	<b>730</b>
Vascular lesions affecting CNS	330-334	.5	14.2	7.2	21.46	305	155
<b>Diseases of the circulatory system</b>	<b>400-468</b>	<b>11.8</b>	<b>10.4</b>	<b>122.5</b>	<b>22.60</b>	<b>236</b>	<b>2,769</b>
Diseases of heart	410-443	4.6	13.2	60.3	23.42	310	1,413
Arteriosclerotic & degenerative	420-422	2.6	13.8	35.4	23.22	322	822
Hypertension	440-447	.7	11.8	8.2	22.17	261	181
Hemorrhoids	461	4.7	7.7	36.2	21.44	164	777
<b>Diseases of the respiratory system</b>	<b>470-527</b>	<b>6.6</b>	<b>5.8</b>	<b>38.4</b>	<b>23.93</b>	<b>140</b>	<b>919</b>
Diseases of upper respiratory system	470-475:510-517	3.0	3.7	11.3	24.81	93	279
Influenza	480-483	.3	6.0	1.8	20.90	125	38
Pneumonia	490-493	1.9	8.4	15.8	22.37	187	353
Bronchitis	500-502	.7	6.5	4.6	23.49	152	109
<b>Diseases of the digestive system</b>	<b>530-587</b>	<b>23.7</b>	<b>8.7</b>	<b>205.3</b>	<b>24.77</b>	<b>215</b>	<b>5,086</b>
Ulcer of stomach, duodenum & jejunum	540-542	4.2	9.0	38.0	25.49	228	968
Appendicitis	550-553	2.1	7.4	15.8	25.86	189	406
Hernia of abdominal cavity	560-561	3.6	8.0	28.6	22.14	178	634
Diseases of gallbladder	584-586	5.0	10.2	51.4	24.41	250	1,254
<b>Diseases of the genitourinary system</b>	<b>590-637</b>	<b>22.4</b>	<b>7.3</b>	<b>163.0</b>	<b>25.54</b>	<b>185</b>	<b>4,162</b>
Nephritis, chronic & unspecified, etc.	592-594	.1	9.6	1.4	28.57	275	39
Diseases of male genital organs	610-617	1.2	5.9	6.9	24.81	146	172
Diseases of female genital organs	620-637	15.3	7.4	113.4	25.28	187	2,866
<b>Obstetrical care</b>	<b>640-689</b>	<b>12.6</b>	<b>5.1</b>	<b>63.7</b>	<b>26.46</b>	<b>134</b>	<b>1,686</b>
Deliveries	660-678	10.0	5.4	54.0	26.51	143	1,432
Pre- and post-natal conditions	640-652:680-689	2.6	3.8	9.7	26.18	98	254
<b>Diseases of skin and cellular tissue</b>	<b>690-716</b>	<b>1.5</b>	<b>8.0</b>	<b>12.0</b>	<b>21.79</b>	<b>174</b>	<b>262</b>
<b>Diseases of the bones, etc.</b>	<b>720-749</b>	<b>5.9</b>	<b>10.4</b>	<b>61.3</b>	<b>22.61</b>	<b>235</b>	<b>1,386</b>
Arthritis	720-725	1.2	10.1	12.1	23.36	236	282
<b>Congenital malformations</b>	<b>750-759</b>	<b>.0</b>	<b>11.3</b>	<b>.4</b>	<b>29.29</b>	<b>331</b>	<b>13</b>
<b>Certain diseases of early infancy</b>	<b>760-776</b>	<b>.0</b>	<b>3.2</b>	<b>.2</b>	<b>23.83</b>	<b>77</b>	<b>4</b>
<b>Symptoms, senility, and ill-defined</b>	<b>780-795</b>	<b>1.3</b>	<b>8.1</b>	<b>10.8</b>	<b>24.38</b>	<b>199</b>	<b>264</b>
<b>Accidents, poisonings and violence</b>	<b>N800-N999</b>	<b>5.9</b>	<b>9.8</b>	<b>58.2</b>	<b>21.53</b>	<b>212</b>	<b>1,253</b>
Fractures and dislocations	N800-N839	2.4	14.5	35.2	20.70	305	731
Other injuries	N840-N999	3.5	6.6	23.0	22.81	150	524

Note: Same as Table 1.

Health Information Foundation

Table 6

**Selected Measures of Hospital Utilization and Costs for Ages 50-64  
By Diagnostic Category, Blue Cross Hospital Service, Indiana, 1956**

Major Categories & Sub-Categories of Diagnostic Conditions	ISC Code Numbers	Admissions per 1,000 population	Average length of stay (days)	Annual days per 1,000 population	Hospital bill per day	Hospital bill per admission	Annual hospital bill per 1,000 population
<b>ALL CATEGORIES</b>		<b>138.7</b>	<b>11.3</b>	<b>1,573.4</b>	<b>\$23.03</b>	<b>\$261</b>	<b>\$36,240</b>
<b>Infective and parasitic diseases</b>	<b>001-138</b>	<b>1.4</b>	<b>14.3</b>	<b>20.0</b>	<b>17.92</b>	<b>255</b>	<b>358</b>
Tuberculosis (all forms)	00 0 9	8	6.6	13.0	15.59	259	203
Dysentery	045-048	0	9.0	.4	20.56	185	8
Acute poliomyelitis and its late effects	080-08	—	—	—	—	—	—
<b>Malignant neoplasms (cancer)</b>	<b>140-205</b>	<b>8.1</b>	<b>17.0</b>	<b>138.2</b>	<b>24.72</b>	<b>421</b>	<b>3,415</b>
Of digestive organs and peritoneum	150-159	8	2.4	36.1	26.01	532	939
Of respiratory system	160-165	1.0	5.6	16.3	22.61	432	451
Of breast	170	7	15.8	10.9	22.44	354	244
Of genitourinary organs	171-181	2.4	14.4	34.4	23.55	340	811
<b>Benign and unspecified neoplasms</b>	<b>210-239</b>	<b>4.8</b>	<b>7.2</b>	<b>34.2</b>	<b>27.04</b>	<b>193</b>	<b>924</b>
<b>Allergic &amp; metabolic diseases</b>	<b>240-289</b>	<b>7.2</b>	<b>11.1</b>	<b>80.2</b>	<b>22.53</b>	<b>251</b>	<b>1,807</b>
Asthma	241	5	8.7	13.4	23.19	201	311
Diseases of thyroid gland	250-254	1.4	8.3	11.4	25.91	214	295
Diabetes mellitus	260	3.8	3.2	49.5	21.61	285	1,069
<b>Diseases of the blood, etc.</b>	<b>290-299</b>	<b>.9</b>	<b>9.4</b>	<b>8.4</b>	<b>26.90</b>	<b>253</b>	<b>225</b>
<b>Mental disorders</b>	<b>300-326</b>	<b>2.7</b>	<b>16.8</b>	<b>46.2</b>	<b>20.27</b>	<b>341</b>	<b>936</b>
<b>Diseases of the nervous system</b>	<b>330-398</b>	<b>6.6</b>	<b>12.2</b>	<b>80.8</b>	<b>20.85</b>	<b>254</b>	<b>1,686</b>
Vascular lesions affecting CNS	330-334	2	16.8	35.1	19.90	334	699
<b>Diseases of the circulatory system</b>	<b>400-468</b>	<b>26.6</b>	<b>13.4</b>	<b>357.0</b>	<b>21.98</b>	<b>295</b>	<b>7,846</b>
Diseases of heart	4 0 443	7.0	14.7	250.5	22.17	326	5,554
Arteriosclerotic & degenerative	420-422	0.6	6.0	170.5	22.27	357	3,798
Hypertension	440-447	2.9	11.7	34.4	20.87	245	718
Hemorrhoids	461	4.6	9.0	41.4	21.43	192	887
<b>Diseases of the respiratory system</b>	<b>470-527</b>	<b>10.0</b>	<b>8.2</b>	<b>81.8</b>	<b>22.89</b>	<b>187</b>	<b>1,872</b>
Diseases of upper respiratory system	470-475 5 0 5 7	3.0	5.3	15.9	23.00	122	365
Influenza	480-483	.4	6.6	2.6	20.66	137	53
Pneumonia	490-493	3.4	9.7	32.7	22.20	216	726
Bronchitis	500-502	1.5	8.6	13.1	22.01	189	288
<b>Diseases of the digestive system</b>	<b>530-587</b>	<b>32.2</b>	<b>10.3</b>	<b>333.5</b>	<b>24.56</b>	<b>254</b>	<b>8,189</b>
Ulcer of stomach, duodenum & jejunum	540-542	5.6	10.6	59.4	26.20	279	1,557
Appendicitis	550-553	1.6	9.6	15.7	24.93	240	391
Hernia of abdominal cavity	560-561	5.5	9.5	52.1	21.90	208	1,141
Diseases of gallbladder	584-586	7.9	11.7	91.9	24.20	283	2,223
<b>Diseases of the genitourinary system</b>	<b>590-637</b>	<b>18.9</b>	<b>8.5</b>	<b>161.5</b>	<b>24.74</b>	<b>211</b>	<b>3,994</b>
Nephritis, chronic & unspecified, etc.	592-594	.2	16.5	3.4	22.55	372	78
Diseases of male genital organs	6 0 617	2.5	10.2	26.0	23.98	245	622
Diseases of female genital organs	620-637	8.1	8.5	68.6	24.19	206	1,658
<b>Obstetrical care</b>	<b>640-689</b>	<b>.1</b>	<b>7.6</b>	<b>.6</b>	<b>24.80</b>	<b>189</b>	<b>16</b>
Deliveries	660-678	8	7	.5	25.92	225	14
Pre- and post-natal conditions	640-652 680-689	0	4.5	.1	18.33	83	2
<b>Diseases of skin and cellular tissue</b>	<b>690-716</b>	<b>1.8</b>	<b>11.1</b>	<b>20.0</b>	<b>20.77</b>	<b>231</b>	<b>415</b>
<b>Diseases of the bones, etc.</b>	<b>720-749</b>	<b>7.2</b>	<b>12.0</b>	<b>87.2</b>	<b>22.78</b>	<b>274</b>	<b>1,986</b>
Arthritis	720-725	2.5	3.0	32.5	23.08	300	751
<b>Congenital malformations</b>	<b>750-759</b>	<b>.0</b>	<b>2.5</b>	<b>.1</b>	<b>30.80</b>	<b>77</b>	<b>2</b>
<b>Certain diseases of early infancy</b>	<b>760-776</b>	<b>.0</b>	<b>5.0</b>	<b>.2</b>	<b>20.00</b>	<b>100</b>	<b>3</b>
<b>Symptoms, senility, and ill-defined</b>	<b>780-795</b>	<b>1.7</b>	<b>9.2</b>	<b>15.2</b>	<b>24.69</b>	<b>228</b>	<b>376</b>
<b>Accidents, poisonings and violence</b>	<b>N800-N999</b>	<b>8.3</b>	<b>13.0</b>	<b>108.5</b>	<b>20.19</b>	<b>263</b>	<b>2,191</b>
Fractures and dislocations	N800-N839	5.0	6.8	83.9	19.73	331	1,655
Other injuries	N840-N999	3.3	7.4	24.6	21.76	161	535

Note: Same as Table 1.

Health Information Foundation

Table 7

**Selected Measures of Hospital Utilization and Costs for Ages 65 and Over  
By Diagnostic Category, Blue Cross Hospital Service, Indiana, 1956**

Major Categories & Sub-Categories of Diagnostic Conditions	ISC Code Numbers	Admissions per 1,000 population	Average length of stay (days)	Annual days per 1,000 population	Hospital bill per day	Hospital bill per admission	Annual hospital bill per 1,000 population
<b>ALL CATEGORIES</b>		<b>220.4</b>	<b>14.7</b>	<b>3,249.9</b>	<b>\$21.87</b>	<b>\$322</b>	<b>\$71,070</b>
<b>Infective and parasitic diseases</b>	<b>001-138</b>	<b>1.6</b>	<b>15.4</b>	<b>23.9</b>	<b>19.00</b>	<b>292</b>	<b>454</b>
Tuberculosis (all forms)	001-019	.5	17.0	9.1	16.51	281	150
Dysentery	045-048	.2	4.3	.8	29.71	126	22
Acute poliomyelitis and its late effects	080-081	—	—	—	—	—	—
<b>Malignant neoplasms (cancer)</b>	<b>140-205</b>	<b>17.3</b>	<b>16.8</b>	<b>291.7</b>	<b>23.62</b>	<b>398</b>	<b>6,888</b>
Of digestive organs and peritoneum	150-159	4.0	19.7	79.7	24.25	478	1,932
Of respiratory system	160-165	2.4	16.9	41.3	25.27	427	1,044
Of breast	170	1.2	18.5	21.4	24.21	449	518
Of genitourinary organs	171-181	4.1	15.0	62.1	23.22	349	1,443
<b>Benign and unspecified neoplasms</b>	<b>210-239</b>	<b>4.3</b>	<b>7.1</b>	<b>30.3</b>	<b>25.98</b>	<b>185</b>	<b>787</b>
<b>Allergic &amp; metabolic diseases</b>	<b>240-289</b>	<b>9.2</b>	<b>14.8</b>	<b>136.5</b>	<b>21.65</b>	<b>320</b>	<b>2,955</b>
Asthma	241	1.8	11.3	20.5	23.21	262	476
Diseases of thyroid gland	250-254	.6	18.9	10.9	21.62	409	236
Diabetes mellitus	260	6.2	6	99.8	21.26	341	2,122
<b>Diseases of the blood, etc.</b>	<b>290-299</b>	<b>1.8</b>	<b>11.2</b>	<b>19.8</b>	<b>26.36</b>	<b>294</b>	<b>522</b>
<b>Mental disorders</b>	<b>300-326</b>	<b>3.0</b>	<b>18.4</b>	<b>54.9</b>	<b>17.84</b>	<b>329</b>	<b>978</b>
<b>Diseases of the nervous system</b>	<b>330-398</b>	<b>18.0</b>	<b>18.6</b>	<b>334.8</b>	<b>19.33</b>	<b>360</b>	<b>6,471</b>
Vascular lesions affecting CNS	330-334	9.6	24.3	233.4	18.82	458	4,391
<b>Diseases of the circulatory system</b>	<b>400-468</b>	<b>55.3</b>	<b>15.2</b>	<b>839.2</b>	<b>21.74</b>	<b>330</b>	<b>18,245</b>
Diseases of heart	4 0 443	4	5.4	633.0	21.87	337	3,847
Arteriosclerotic & degenerative	420-422	25.8	15.9	409.9	22.75	361	9,325
Hypertension	440-447	5.7	4.1	80.8	20.22	285	1,634
Hemorrhoids	461	3.2	0.2	33.1	21.98	225	728
<b>Diseases of the respiratory system</b>	<b>470-527</b>	<b>15.5</b>	<b>10.5</b>	<b>162.7</b>	<b>21.98</b>	<b>230</b>	<b>3,576</b>
Diseases of upper respiratory system	470-475; 510-517	2.4	6.5	15.9	20.26	132	323
Influenza	480-483	.7	6.7	4.4	19.80	132	88
Pneumonia	490-493	7.2	13.1	94.9	22.50	295	2,136
Bronchitis	500-502	2.5	9.1	22.6	8.70	70	422
<b>Diseases of the digestive system</b>	<b>530-587</b>	<b>38.5</b>	<b>12.4</b>	<b>478.3</b>	<b>24.45</b>	<b>304</b>	<b>11,695</b>
Ulcer of stomach, duodenum & jejunum	540-542	6.4	13.5	86.9	25.91	350	2,252
Appendicitis	550-553	2	11.2	13.0	23.07	259	299
Hernia of abdominal cavity	560-561	7.2	0.7	77.3	22.61	243	1,747
Diseases of gallbladder	584-586	9.0	14.8	133.6	23.88	354	3,191
<b>Diseases of the genitourinary system</b>	<b>590-637</b>	<b>26.1</b>	<b>12.5</b>	<b>325.7</b>	<b>24.02</b>	<b>300</b>	<b>7,824</b>
Nephritis, chronic & unspecified, etc.	592-594	4	8.5	3.0	21.65	184	65
Diseases of male genital organs	610-617	9.6	14.9	43.5	24.09	359	3,459
Diseases of female genital organs	620-637	5.1	11.4	58.0	23.08	284	1,337
<b>Obstetrical care</b>	<b>640-689</b>	<b>.1</b>	<b>7.0</b>	<b>.9</b>	<b>25.43</b>	<b>178</b>	<b>24</b>
Deliveries	660-678	1	7	0	25.43	178	24
Pre- and post-natal conditions	640-652; 680-689	0	—	—	—	—	—
<b>Diseases of skin and cellular tissue</b>	<b>690-716</b>	<b>2.3</b>	<b>11.4</b>	<b>26.2</b>	<b>18.79</b>	<b>214</b>	<b>493</b>
<b>Diseases of the bones, etc.</b>	<b>720-749</b>	<b>8.4</b>	<b>16.1</b>	<b>134.0</b>	<b>20.46</b>	<b>329</b>	<b>2,743</b>
Arthritis	720-725	3.4	5	19.64	20.97	297	1,004
<b>Congenital malformations</b>	<b>750-759</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>
<b>Certain diseases of early infancy</b>	<b>760-776</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>
<b>Symptoms, senility, and ill-defined</b>	<b>780-795</b>	<b>3.2</b>	<b>9.8</b>	<b>31.4</b>	<b>23.80</b>	<b>234</b>	<b>747</b>
<b>Accidents, poisonings and violence</b>	<b>N800-N999</b>	<b>15.9</b>	<b>22.7</b>	<b>359.6</b>	<b>18.54</b>	<b>421</b>	<b>6,667</b>
Fractures and dislocations	N800-N839	10.9	26.6	290.4	18.16	483	5,273
Other injuries	N840-N999	4.9	14.0	69.2	20.15	283	1,394

Note: Same as Table 1.

Health Information Foundation

These rates were computed against the total population at ages 20-34; however, the predominance of obstetrical care is even more marked when it is related only to the female population at these ages. Thus its rates per 1,000 females for admissions, days of use, and annual hospital bill were 162.8, 731.6, and \$18,991, respectively, and they constituted 66, 57, and 59 per cent of their respective totals for all diagnoses.

Ranking second and third, respectively, genitourinary diseases and digestive diseases followed obstetrical care in importance at ages 20-34. The genitourinary diseases were more important among females, while the digestive diseases predominated among males.

In both the following age groups, 35-49 and 50-64, digestive diseases constituted the leading diagnostic category. At 35-49 the rates per 1,000 for these diseases for admissions, days of use, and hospital bill were 23.7, 205.3, and \$5,086, respectively (see Table 5), while at 50-64 they were 32.2, 333.5, and \$8,189 (see Table 6). For each of these measures, digestive diseases constituted between 21 and 23 per cent of the rate for all diagnostic categories.

At 35-49 genitourinary diseases were still very prominent, ranking second to the digestive diseases in all three measures—admissions, use, and charges. But at 50-64 their place was taken over by the circulatory diseases which ranked second for admissions and charges, actually even exceeding the digestive diseases by a small margin in annual hospital use.

At 65 and over, the circulatory diseases become by far the most prominent, exceeding all other diagnostic categories by a substantial margin in all three measures. The circulatory diseases account, per 1,000 population annually, for 55.3 admissions, 839.2 days of use, and \$18,245 in hospital bills (see Table 7). Each of these figures represents close to one-fourth of its total for all diagnoses at 65 and over.

The digestive diseases rank second at 65 and over, with 38.5 admissions, 478.3 days of use, and \$11,695 in hospital charges (each per 1,000 population). These figures represent 17.5, 14.7, and 16.5 per cent, respectively, of the figure for all diagnoses in

this age group. Other important categories at age 65 and over are genitourinary diseases, cancer, accidents, and nervous disorders.

### Surgical use in the hospital

About two-thirds of the hospital admissions, 78.4 per 1,000 population, were for surgery (see Chart IV). As for all admissions, the rate was highest, 24.0 per 1,000 population, for obstetrical care.\* This was followed by admissions with surgery for respiratory diseases at 12.2 per 1,000, and genitourinary diseases at 11.5 (see Table 8). The per cent of surgical to all admissions in each major category varied from 100 (by definition) for obstetrical care, 99 for accidents, and 94 for benign neoplasms, all the way down to zero (actually less than 0.5 per cent) for mental disorders.

The average length of stay for surgical cases, 6.2 days per admission, was only 85 per cent as long as that for all admissions. It was longest for surgically treated cancer at 15.4 days per case. While for most diagnoses average length of stay per surgical admission was close to that for all admissions, there were some wide divergencies. For example, at 25.4 days per case, surgical admissions for diabetes averaged over double the figure for all admissions for diabetes. At the other extreme, at 1.7 days per case, surgical admissions for respiratory diseases averaged only half as long as all admissions for this major diagnostic category.

In terms of total utilization, admissions with surgery amounted to 485.6 hospital days per 1,000 annually, or 58 per cent of total hospital days. Obstetrical care (surgery by definition) totaled 109.5 days, or 22.5 per cent of total surgical days, followed by digestive diseases at 90.2 days and genitourinary diseases at 80.4 days.

### The surgical bill

The hospital bill per day among these surgical admissions averaged \$24.69 (see Chart V)—\$1.78 (or about 8 per cent) above the average for all admissions. Surgical admissions for respira-

\*Because of the way in which the data were originally tabulated, the entire category of obstetrical care is here classified as surgical. With obstetrical care excluded from the category of surgery, surgical admissions stood at 54.4, obstetrical at 24.0 and all other at 37.1 per 1,000.

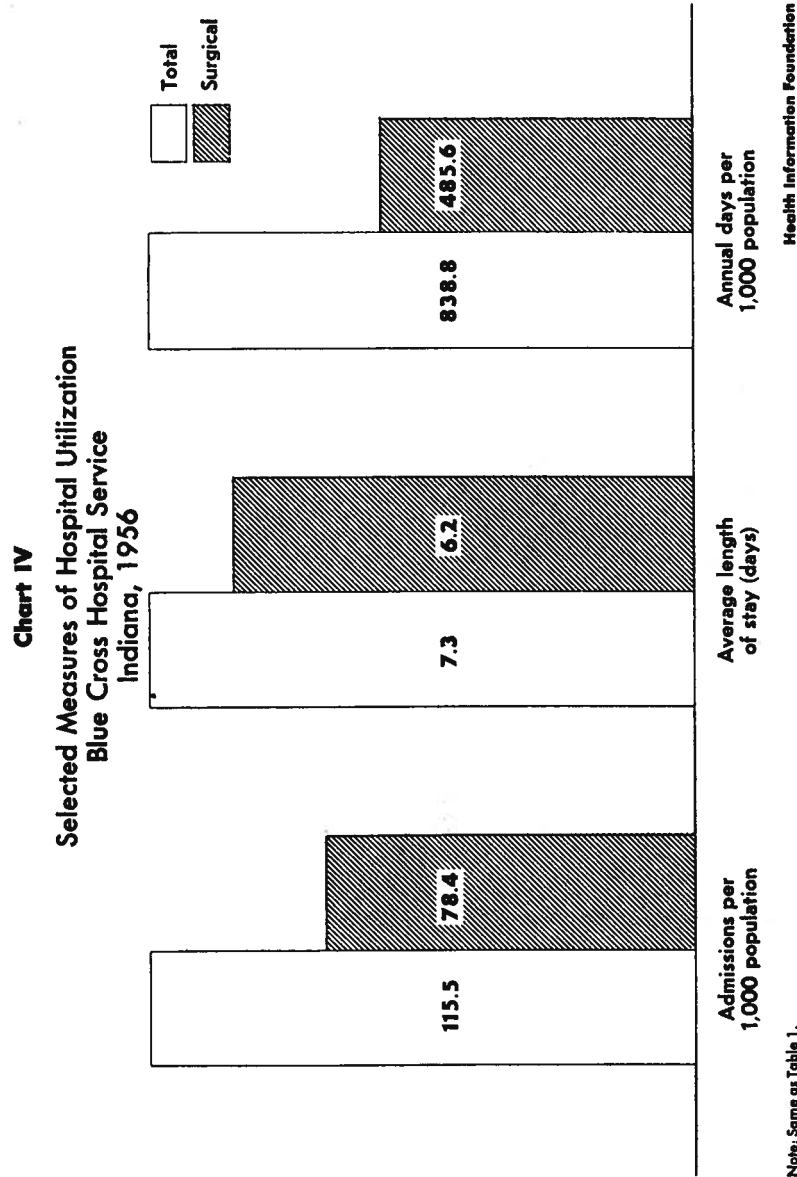


Table 8

**Selected Measures of Hospital Utilization and Costs for Surgery**  
**By Diagnostic Category, Blue Cross Hospital Service, Indiana, 1956**

Major Categories & Sub-Categories of Diagnostic Conditions	ISC Code Numbers	Admissions per 1,000 population	Average length of stay (days)	Annual days per 1,000 population	Hospital bill per day	Hospital bill per admission	Annual hospital bill per 1,000 population
<b>ALL CATEGORIES</b>		<b>78.4</b>	<b>6.2</b>	<b>485.6</b>	<b>\$24.69</b>	<b>\$153</b>	<b>\$11,988</b>
<b>Infective and parasitic diseases</b>	<b>001-138</b>	<b>.2</b>	<b>12.9</b>	<b>2.3</b>	<b>23.50</b>	<b>304</b>	<b>53</b>
Tuberculosis (all forms)	001-019	.1	9.8	.5	32.88	323	16
Dysentery	045-048	.0	14.0	.0	23.00	322	1
Acute poliomyelitis and its late effects	080-081	.1	14.9	1.4	20.16	300	28
<b>Malignant neoplasms (cancer)</b>	<b>140-205</b>	<b>1.4</b>	<b>15.4</b>	<b>21.4</b>	<b>26.60</b>	<b>409</b>	<b>569</b>
Of digestive organs and peritoneum	150-159	.2	22.2	5.2	27.61	613	144
Of respiratory system	160-165	.1	16.2	2.4	29.00	471	69
Of breast	170	.2	13.0	2.1	24.98	325	52
Of genitourinary organs	171-181	.5	12.8	6.8	25.31	325	173
<b>Benign and unspecified neoplasms</b>	<b>210-239</b>	<b>3.4</b>	<b>5.0</b>	<b>16.9</b>	<b>27.16</b>	<b>136</b>	<b>460</b>
<b>Allergic &amp; metabolic diseases</b>	<b>240-289</b>	<b>.7</b>	<b>11.2</b>	<b>7.5</b>	<b>24.84</b>	<b>277</b>	<b>187</b>
Asthma	241	.0	9.5	.3	27.47	261	8
Diseases of thyroid gland	250-254	.5	8.5	4.3	25.67	218	111
Diabetes mellitus	260	.1	25.4	2.4	22.91	581	56
<b>Diseases of the blood, etc.</b>	<b>290-299</b>	<b>.1</b>	<b>8.7</b>	<b>.7</b>	<b>29.66</b>	<b>258</b>	<b>20</b>
<b>Mental disorders</b>	<b>300-326</b>	<b>.0</b>	<b>14.3</b>	<b>.5</b>	<b>24.31</b>	<b>348</b>	<b>13</b>
<b>Diseases of the nervous system</b>	<b>330-398</b>	<b>1.5</b>	<b>8.5</b>	<b>12.4</b>	<b>22.68</b>	<b>193</b>	<b>281</b>
Vascular lesions affecting CNS	330-334	.1	26.0	1.4	24.24	629	33
<b>Diseases of the circulatory system</b>	<b>400-468</b>	<b>3.0</b>	<b>9.0</b>	<b>26.8</b>	<b>22.80</b>	<b>206</b>	<b>612</b>
Diseases of heart	410-443	.2	18.4	2.8	26.64	490	76
Arteriosclerotic & degenerative	420-422	.1	23.0	1.3	25.97	598	34
Hypertension	440-447	.0	14.5	.7	23.70	344	16
Hemorrhoids	461	2.1	8.0	17.0	21.35	171	362
<b>Diseases of the respiratory system</b>	<b>470-527</b>	<b>12.2</b>	<b>1.7</b>	<b>20.9</b>	<b>31.12</b>	<b>53</b>	<b>652</b>
Diseases of upper respiratory system	470-475; 510-517	11.8	1.5	17.5	31.60	47	552
Influenza	480-483	.0	5.0	.0	18.20	91	0
Pneumonia	490-493	.1	11.9	.6	24.24	288	16
Bronchitis	500-502	.1	6.4	.5	26.74	172	14
<b>Diseases of the digestive system</b>	<b>530-587</b>	<b>9.9</b>	<b>9.1</b>	<b>90.2</b>	<b>24.54</b>	<b>222</b>	<b>2,213</b>
Ulcer of stomach, duodenum & jejunum	540-542	.5	15.9	7.2	28.87	458	208
Appendicitis	550-553	3.1	6.4	19.5	24.13	154	470
Hernia of abdominal cavity	560-561	2.9	7.0	20.5	22.24	156	455
Diseases of gallbladder	584-586	1.7	13.2	22.8	24.24	320	552
<b>Diseases of the genitourinary system</b>	<b>590-637</b>	<b>11.5</b>	<b>7.0</b>	<b>80.4</b>	<b>25.30</b>	<b>177</b>	<b>2,033</b>
Nephritis, chronic & unspecified, etc.	592-594	.0	11.3	.5	27.42	311	13
Diseases of male genital organs	610-617	1.7	5.2	8.9	24.94	130	222
Diseases of female genital organs	620-637	7.3	7.1	52.0	24.72	176	1,287
<b>Obstetrical care</b>	<b>640-689</b>	<b>24.0</b>	<b>4.6</b>	<b>109.5</b>	<b>26.02</b>	<b>119</b>	<b>2,849</b>
Deliveries	660-678	20.1	4.8	96.7	26.35	127	2,549
Pre- and post-natal conditions	640-652; 680-689	3.9	3.3	12.8	23.52	77	300
<b>Diseases of skin and cellular tissue</b>	<b>690-716</b>	<b>.7</b>	<b>7.3</b>	<b>5.3</b>	<b>21.07</b>	<b>153</b>	<b>112</b>
<b>Diseases of the bones, etc.</b>	<b>720-749</b>	<b>1.8</b>	<b>11.0</b>	<b>20.1</b>	<b>23.30</b>	<b>257</b>	<b>469</b>
Arthritis	720-725	.1	14.4	1.9	24.15	347	46
<b>Congenital malformations</b>	<b>750-759</b>	<b>.5</b>	<b>10.6</b>	<b>5.0</b>	<b>20.93</b>	<b>223</b>	<b>104</b>
<b>Certain diseases of early infancy</b>	<b>760-776</b>	<b>.1</b>	<b>10.1</b>	<b>1.2</b>	<b>13.67</b>	<b>138</b>	<b>17</b>
<b>Symptoms, senility, and ill-defined</b>	<b>780-795</b>	<b>.3</b>	<b>8.6</b>	<b>2.2</b>	<b>26.77</b>	<b>231</b>	<b>58</b>
<b>Accidents, poisonings and violence</b>	<b>N800-N999</b>	<b>7.1</b>	<b>8.7</b>	<b>62.2</b>	<b>20.69</b>	<b>181</b>	<b>1,287</b>
Fractures and dislocations	N800-N839	3.0	13.1	39.6	19.94	261	789
Other injuries	N840-N999	4.1	5.5	22.7	21.98	121	498

Note: Same as Table 1.

tory diseases averaged the highest bill per day among the major diagnoses, \$31.12, followed by diseases of the blood and benign neoplasms at \$29.66 and \$27.16, respectively. Here again, for surgical admissions as for all admissions, the short length of stay was very often associated with a high average cost per day and vice versa.

The bill for each surgical admission averaged \$153, or 92 per cent of the average bill per case among all admissions. As with total admissions, surgical admissions for cancer were the highest among the major diagnostic categories, averaging \$409 per admission.

The surgical hospital bill for all causes amounted to \$11,988 per 1,000 persons (\$11.99 per person), when averaged over the entire covered population, or 62 per cent of the total hospital bill. Just under one-fourth—23.8 per cent—of the surgical bill was due to obstetrical care (surgery by definition), \$2,849 per 1,000 (\$2.85 per person). Surgical admissions for digestive diseases and genitourinary diseases followed at \$2,213 and \$2,033 per 1,000, respectively.

**Surgical use and charges by age**

Surgical admissions varied with age and sex in much the same manner as did all hospital admissions. Thus women in the main childbearing ages (20-34) again experienced the highest rate, 222.5 per 1,000 (see Table 9), almost three times the average rate of 78.4 per 1,000 for all surgical admissions.

Also, with obstetrical care excluded, the pattern of surgical admissions was similar to that for all hospital admissions, except that the rise with age was not as sharp (see Chart II). As age increased, the proportion of total admissions involving surgery decreased, from 69 per cent at ages 20-34 to only 39 per cent at 65 and over.

Average duration of stay per surgical admission rose from 3.5 days at under age 20 to 16.2 days at 65 and over. The amount of annual hospital use involving surgery (excluding obstetrics) also rose sharply with age (see Chart III), from 172.4 per 1,000 for

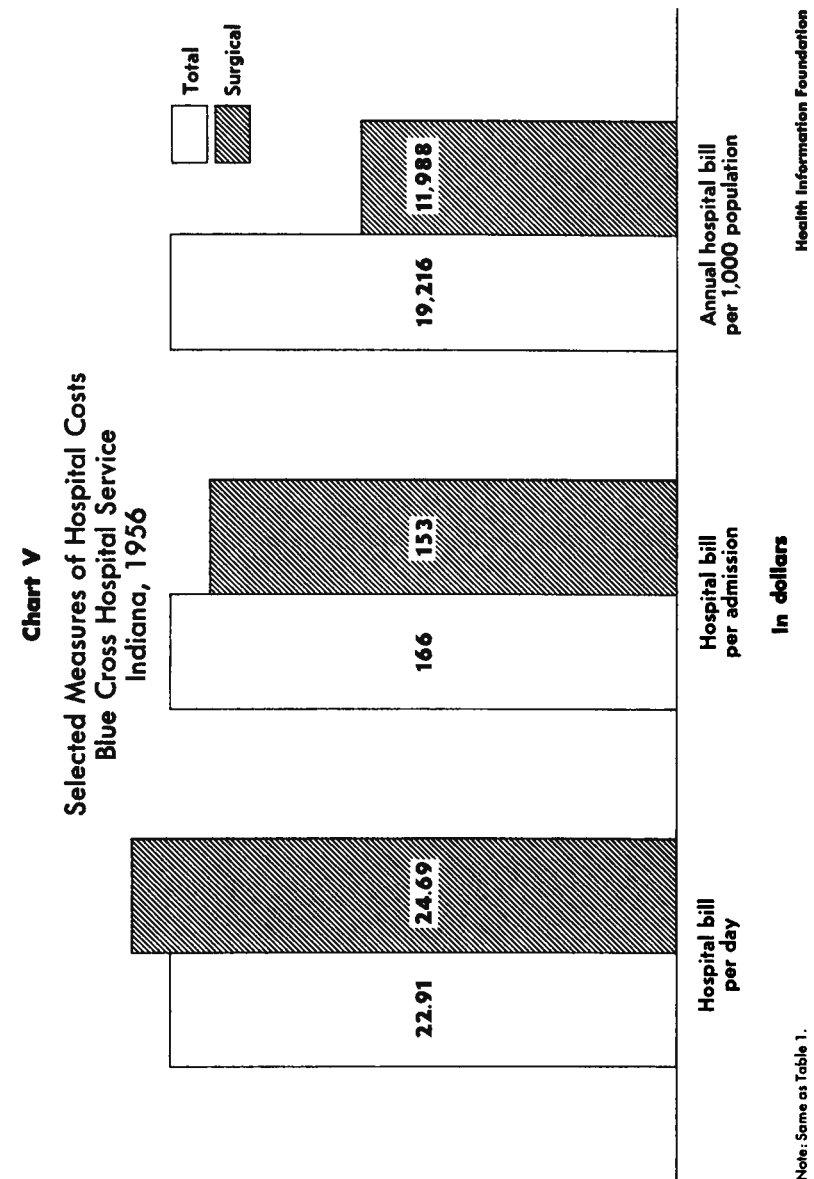


Table 9

**Selected Measures of Hospital Utilization and Costs for Surgery  
By Age and Sex, Blue Cross Hospital Service, Indiana, 1956**

Age and Sex	Admissions per 1,000 population	Average length of stay (days)	Annual days per 1,000 population	Hospital bill per day	Hospital bill per admission	Annual hospital bill per 1,000 population
<b>ALL AGES</b>						
Both Sexes	78.4	6.2	485.6	\$24.69	\$153	\$11,988
<b>Under 20 years</b>						
Both Sexes	49.5	3.5	172.4	24.03	84	4,142
<b>Over 20</b>						
Both Sexes—Total	97.9	7.1	697.2	24.80	177	17,291
Excluding obstetrics	57.7	8.9	513.9	24.36	217	12,522
Male	45.0	9.4	421.0	24.61	230	10,362
Female—Total	146.4	6.5	950.6	24.88	162	23,646
Excluding obstetrics	69.3	8.6	599.2	24.20	209	14,502
<b>20-34</b>						
Both Sexes—Total	137.3	5.2	710.5	25.33	131	17,995
Excluding obstetrics	48.6	6.4	311.9	24.52	157	7,648
Male	35.4	6.8	239.7	24.35	165	5,836
Female—Total	222.5	5.0	1,103.9	25.50	127	28,152
Excluding obstetrics	59.6	6.2	372.3	24.61	154	9,161
<b>35-49</b>						
Both Sexes—Total	73.1	7.9	577.9	25.06	198	14,480
Excluding obstetrics	60.5	8.5	514.2	24.88	211	12,794
Male	42.3	8.3	352.0	24.98	208	8,791
Female—Total	102.5	7.7	793.0	25.09	194	19,898
Excluding obstetrics	77.9	8.6	668.6	24.84	213	16,605
<b>50-64</b>						
Both Sexes	64.6	11.3	731.6	24.23	274	17,729
Male	58.1	11.4	664.3	24.76	283	16,449
Female	71.0	11.2	796.8	23.81	267	18,970
<b>65 and over</b>						
Both Sexes	86.5	16.2	1,402.0	22.80	369	31,963
Male	85.6	15.6	1,335.3	23.98	374	32,020
Female	87.6	16.9	1,484.5	21.48	364	31,893

Note: Same as Table 1.

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persons under 20 to 1,402.0 at 65 and over. However, with obstetrical care included, a secondary peak was evident for surgical days of use per 1,000 at 710.5 at ages 20-34.

As for all admissions, the average charges per surgical admission increased steadily with age—from \$84 at ages under 20 to \$369 at 65 and over. And finally, the annual hospital bill for surgery (obstetrics excluded) also rose with age, from \$4,142 per 1,000 (\$4.14 per person) under age 20 to \$31,963 (\$31.96 per person) at 65 and over.

### Surgical diagnoses by age

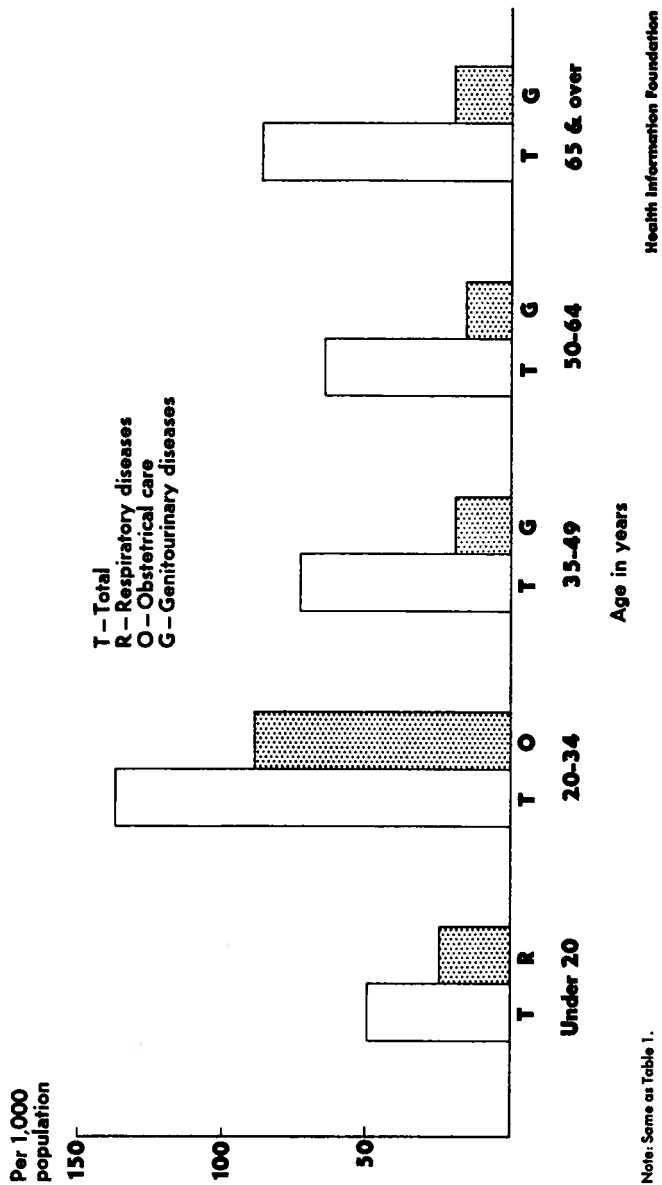
At ages under 20, the surgical admission rate was highest for respiratory diseases, 24.7 per 1,000 population (see Chart VI), or 50 per cent of all surgical admissions in this age group. However, annual surgical days of use were highest for accidents at 42.5 per 1,000 (see Chart VII), or 25 per cent of the total. But respiratory diseases, again, were the most expensive among the major diagnostic categories with surgery at \$1,080 per 1,000 population annually (see Chart VIII), constituting 26 per cent of the total charges for surgery in this age-group.

At ages 20-34, obstetrical care dominated all three measures—admissions, use, and annual charges. This major diagnostic category accounted for 65 per cent of all surgical admissions, 56 per cent of all days of surgical use, and 57 per cent of the total of charges for surgery.

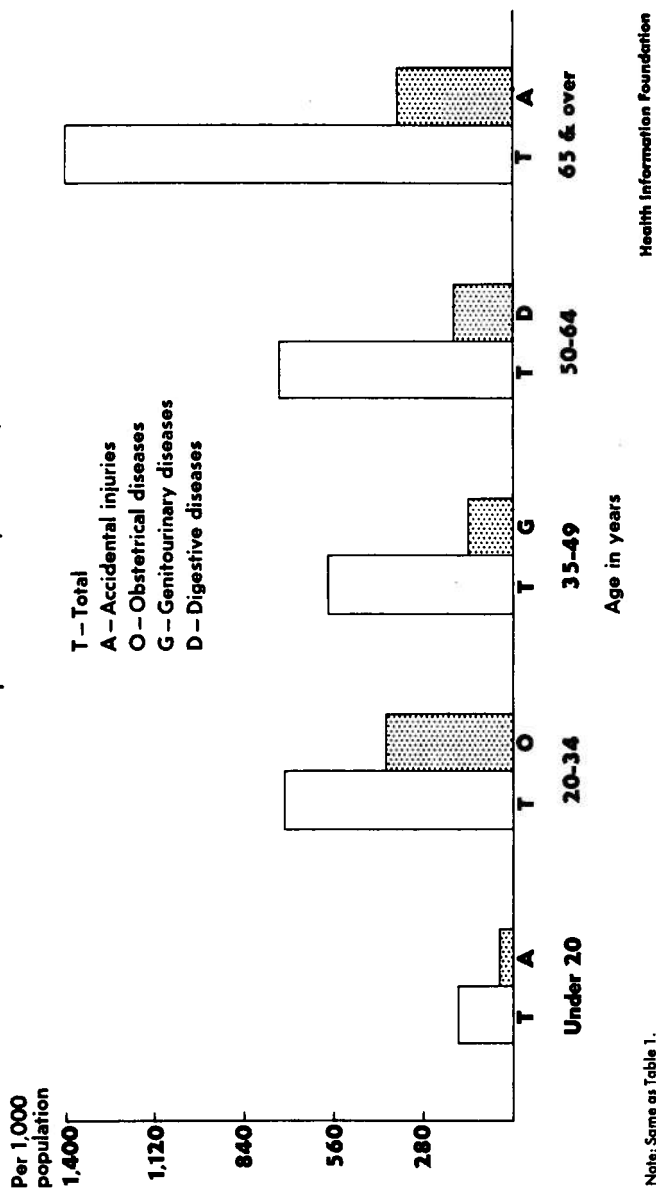
At ages 35-49 rates per 1,000 were highest on all three measures for the genitourinary diseases: 19.2 for admissions; 143.8 days of use; and \$3,705 in charges. At 50-64 the genitourinary diseases also ranked first among all surgical admissions at 15.3 per 1,000, but the digestive diseases were highest in annual days of surgical use (186.6) and annual charges per 1,000 for surgery (\$4,680).

Finally, at 65 and over, admissions with surgery for the genitourinary diseases again led the other major diagnostic categories at 19.6 per 1,000 population. But in this age group the leader in annual days of surgical use was accidents at 359.2 days

**Chart VI**  
Annual Hospital Admissions for Surgery by Age  
For Total and Leading Diagnostic Category  
Blue Cross Hospital Service, Indiana, 1956

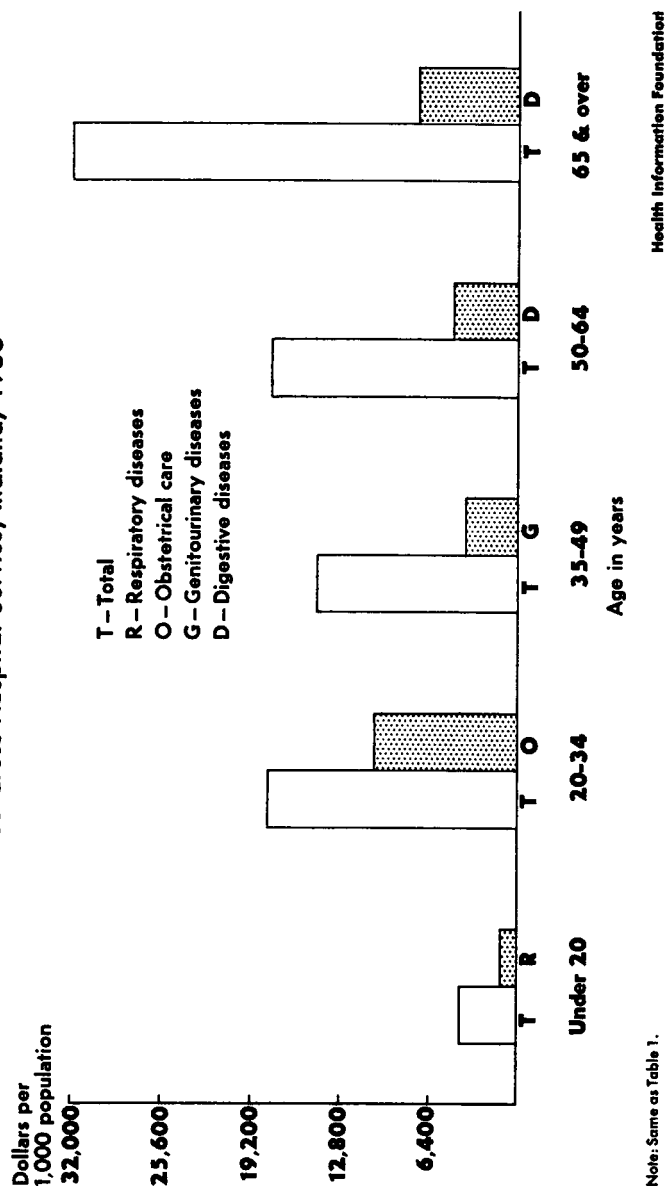


**Chart VII**  
Annual Days of Hospital Use for Surgery by Age  
For Total and Leading Diagnostic Category  
Blue Cross Hospital Service, Indiana, 1956





**Chart VIII**  
**Annual Hospital Bill for Surgery by Age**  
**For Total and Leading Diagnostic Category**  
**Blue Cross Hospital Service, Indiana, 1956**



Note: Same as Table 1.

per 1,000, while the digestive diseases led in annual charges for surgery at \$7,129 per 1,000.

**Conclusion**

As health levels in the United States improve, awareness of the importance of health to the family, the community, and the nation is becoming increasingly widespread. At the same time, however, the growing importance of health is being weighed in the minds of thoughtful members of the community against the consideration of increasing cost in providing the health services necessary to sustain continuing improvement. And because disagreement on this fundamental point exists, health and its costs have become a major issue in this country. An indication of the current state of affairs is the amount of consideration currently being given to health care programs by the United States Congress, the major political parties, and other official and unofficial organizations which formulate public policies or plan their implementation.

A major issue today within the area of health concerns the role of hospitals in the provision of health services, and the mounting costs of maintaining these institutions. Critics of the hospitals contend that “overuse” or “abuse” of their facilities—unnecessary admission of patients—is widespread. Unfortunately, relatively few data are available to policymakers or planners which might be useful in evaluating the merit of these and related criticisms.

Some relevant studies, notably of hospital utilization patterns, do exist, but these are far too few and scattered geographically to provide more than merely a glimpse of the problem. Further, only rarely have these studies attempted to link morbidity and cost data. But this is precisely the merit of the present study. It provides, for one sizeable insured population, precise statistical data on their use of hospital services and the cost of these services—i.e., the amount charged to the insuring organization—by *detailed medical diagnosis*. Further this information is provided by age-group and sex of the population, thus giving a profile of morbidity and costs at various stages of the life-cycle.

The limitations of the study should be kept in mind. For

example, it does not provide data on the social and economic characteristics of the study population—their marital status, color, income, occupation, or other items. Nor does it differentiate readmissions from the total or deal with the non-medical aspects of hospitalization—the home situation of the patient, the availability of alternative facilities elsewhere, etc. Research on these problems is sorely needed, and in fact many studies, among them one conducted in Massachusetts by Health Information Foundation jointly with the National Opinion Research Center of the University of Chicago, are currently attempting to unravel some of these non-medical factors.

Further, the study population is not taken to be a wholly representative cross-section of the U.S., nor even of Indiana. Nevertheless it is large enough to furnish at least some reasonable idea of the patterns which might be found in other insured populations. And hospital costs in Indiana appear to be close to the national average. Therefore, since nationwide data are not presently available, nor are they likely to be so in the very near future, this study may have considerable relevance to the national scene. Many more like it, in different localities and based on different population groups, would be useful.

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