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UTILIZATION OF HEALTH SERVICES IN THE GREAT PLAINS

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ABSTRACT

This health service guide aids rural decisionmakers in the Great Plains in planning needed health services for their area. By following the guide, rural planners can estimate the number of doctors their area can support; the number of cases by age group, sex, and disease that a local hospital could expect each year, and the average bed days required for treatment; the annual use an emergency room might receive; and the number of expected annual calls for ambulance service.

Key words: Health, Rural development, Community services, Health services, Great Plains.

On January 2, 1978, three USDA agencies -- the Economic Research Service, the Statistical Reporting Service, and the Farmer Cooperative Service -- merged into a new organization, the Economics, Statistics, and Cooperatives Service.

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SUMMARY

Local officials and health planners in the Great Plains may use the data provided in this health service guide to plan needed health services for their areas. By following the guide, rural planners can estimate the number of doctors their area can support; the number of cases by age group, sex, and disease that a local hospital could expect each year, and the average bed days required for treatment; the annual use an emergency room might receive; and the number of expected annual calls for ambulance service.

For a fast growing service area, local decisionmakers can use population projections with this guide to estimate the services required over the next 10 to 15 years.

Caution must be used when applying these incidence rates if a local area has important, unique characteristics as these characteristics must be incorporated. In addition, utilization rates may change if technology changes, or if the medical delivery system changes (such as increased emphasis on preventive medicine). This is particularly true in the long run.

When using this guide to estimate local health services needed, both local information and common sense must be used.

UTILIZATION OF HEALTH SERVICES IN THE GREAT PLAINS

*Alan May
Gerald A. Doeksen
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INTRODUCTION

Rural government and health officials must often determine how to improve health services in their areas. 1/ To do this, they need information on the expected need for various services.

This health service guide provides utilization rates for specific health services which decisionmakers in the Great Plains can use to estimate local needs. 2/ By following the guide, rural planners can estimate the number of doctors their area can support; the number of cases by age group, sex, and disease that a local hospital can expect each year, and the average bed days required for treatment; the annual use an emergency room might receive; and the number of expected annual calls for ambulance service.

The guide also illustrates how to use the data by applying it to a rural county in northwest Oklahoma. Alfalfa County had a population of 7,224 in 1970. The largest community was the county seat, Cherokee, with 2,119 residents. The age breakdown for the county shows that during that year there were 944 males under age 15; 1,033 age 15-44; 899 age 45-64; and 662 age 65 and older. There were 737 females under age 15; 1,028 age 15-44; 987 age 45-64; and 934 age 65 and older. 3/

1/ Statistics clearly illustrate that health services are less available and accessible to the 56 million U.S. residents in nonmetropolitan areas than to their metropolitan counterparts. For further information, see (1, 4, and 6). (Underscored numbers in parentheses refer to references listed on page 10.)

2/ Estimated hospital and clinic capital and operating expenses are considered in related reports (5,2).

3/ Bureau of the Census, Census of the Population: 1970. Vol. I, Character of the Population. Part V, Oklahoma.

Local needs can be estimated by substituting local population figures for those of Alfalfa County used in the illustrations in appendix A. Blank forms which contain the utilization rates are provided in appendix B for local use.

When estimating local requirements, decisionmakers need to distinguish between the total number of medical treatments generated by their area residents, and the number of those treatments which would be handled by local physicians and facilities. Based on data collected in a national study (8), 21.4 percent of all medical treatments are performed by specialists. Since specialists tend to locate their practices in urban areas, it may be assumed that 21.4 percent of all medical treatments generated in rural areas would usually be performed outside the rural service areas. 4/ The other 78.6 percent would be performed by local practitioners.

Although the study refers to a change of physician rather than to a change of treatment facility, the 21.4 percent referral also must be considered when estimating local hospital needs. The two concepts are generally equivalent in a rural area because of the lack of specialists; thus, referral of hospital patients is equivalent to transferring treatment and care from a rural to an urban hospital.

By considering this percentage, a decisionmaker can distinguish between the number of patient encounters handled by local physicians and those handled outside the area by specialists. The distinction can also be made between the number of hospital cases (and bed days for treatment) treated locally, and those local residents treated in urban hospitals.

UTILIZATION

Utilization rates are provided for physician, hospital, emergency room, and ambulance usage. The rates were taken or derived from the best of the known data sources available for those services. For each service, the data source and utilization rates are discussed. Caution must be used when applying these utilization rates for long-range predictions. As technology improves and delivery of medical services changes, patient utilization patterns may change.

Physicians

Local decisionmakers can determine the number of physicians needed in their communities by considering the total physician visits generated in their area, the number of these visits which would be to specialists outside the local area, and the number of patients a physician can see in a year. 5/

4/ If a local Great Plains area contains a number of specialists, the number of cases referred outside the area would be reduced accordingly.

5/ It is estimated that a physician can handle at least 3,900 patient encounters per year (8).

Based on the yearly average number of visits a physician is assumed to handle in a year (3,900), local decisionmakers can determine the number of physicians needed for their community. For Alfalfa County, this would be six physicians ($21,743 \div 3,900 = 5.6$).

Hospitals

Hospital utilization rates and length of stay are provided to estimate both the number of hospital cases and the bed days needed for care in a local service area. Although these data were available from national and State surveys (9,7), they were not in the detail desired and other sources were sought. Oklahoma Blue Cross-Blue Shield data on hospital use and length of stay are used in this report. The sample includes over 227,000 males and 238,000 females for 1975, and the data are classified by age, sex, and disease.

Diseases are reported by the classes specified in International Classification of Diseases, Adapted for Use in the United States (10), with some modification. 6/ The annual rate of discharge and mean length of stay for patients generally follows trends in the national data for the same diagnostic categories (9).

Hospital utilization rates and average hospital stay are presented for males by disease and age groups in table 2. Similar data for females are presented in table 3. Each utilization rate indicates the number of hospital visits per 1,000 persons in that age group due to a specific disease. For example, for every 1,000 males under age 15, there are 6.2 accident, poisoning, and violence cases, which an average hospital stay of 3.9 days (table 2). For females of the same age group, there are 4.0 such cases, with an average hospital stay of 4.3 days (table 3).

Utilization rates and average stays noted in this report are rounded to the nearest 10th, and the cases and in-patient days are rounded to the nearest 100th. This rounding causes different totals when completing various forms; however, the differences are slight.

Application

The method to determine hospital cases and in-patient days is illustrated in form 2 for males and in form 3 for females. (Given data from tables 2 and 3 have been entered in forms 2 and 3 for convenience.)

Alfalfa County population figures are first entered in the appropriate places in forms 2 and 3. Then, by multiplying the utilization rate per thousand for a particular age group times the number of thousands of persons, the number of cases per disease per age and sex group is derived. For example, the utilization rate for males under age 15 having circulatory

6/ An explanation of each disease is presented in appendix C.

Table 2--Male hospital utilization rates per 1,000 persons, and average hospital stay 1/ 2/

Illness classification	Under 15 years old <u>3/</u>		15-44 years old		45-64 years old		65 years old and over	
	Utili- zation rate	Average hospital stay	Utili- zation rate	Average hospital stay	Utili- zation rate	Average hospital stay	Utili- zation rate	Average hospital stay
	Cases	Days	Cases	Days	Cases	Days	Cases	Days
Accident, poisoning, and violence	6.2	3.9	12.4	5.3	12.8	6.5	27.4	7.8
Blood, and blood-forming organs	0.6	3.9	0.4	4.7	0.8	6.4	2.0	5.7
Certain causes of perinatal morbidity and mortality	1.9	9.1	0.0	0.0	0.0	0.0	0.0	0.0
Circulatory system	0.4	5.0	5.9	6.1	40.6	8.7	154.8	8.8
Congenital anomalies	2.1	4.9	0.7	5.6	1.3	8.8	1.4	3.5
Digestive system	4.3	3.4	9.5	5.6	24.9	6.8	58.2	7.6
Endocrine, nutritional, and metabolic	0.5	4.1	1.7	5.2	4.2	6.9	12.3	7.2
Genitourinary system	2.5	2.6	8.7	3.5	18.3	5.4	58.9	6.2
Infective, and parasitic	3.0	3.7	3.8	4.4	3.4	5.5	6.8	4.0
Maternity care	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mental disorders	0.4	15.6	4.2	10.0	5.5	9.1	15.1	10.8
Musculoskeletal system, and connective tissue	0.8	4.3	7.6	6.2	13.1	7.1	20.5	8.4
Neoplasms	0.7	4.4	2.7	5.0	14.4	8.5	74.0	9.2
Nervous system and sense organs	5.4	2.5	3.1	5.8	8.2	5.2	25.3	2.9
Respiratory system	10.4	3.6	13.3	4.1	26.5	6.0	86.3	7.5
Skin, and subcutaneous tissue	0.9	3.1	2.6	4.9	2.4	4.6	4.1	7.8
Symptoms, and ill-defined conditions	2.9	3.2	5.4	4.1	11.6	5.4	55.5	2.8
Tonsillectomy	8.6	1.6	1.9	2.6	0.1	5.0	0.0	0.0
Total	51.6	3.5	83.9	5.1	188.1	7.0	602.6	7.4

1/ Data courtesy of Oklahoma Blue Cross-Blue Shield. 2/ All numbers are rounded to nearest tenth.

3/ This age group consists of both minor dependents and policy contract holders.

Table 3--Female hospital utilization rates per 1,000 persons, and average hospital stay 1/ 2/

Illness classification	Under 15 years old <u>3/</u>		15-44 years old		45-64 years old		65 years old and over	
	Utilization rate	Average hospital stay	Utilization rate	Average hospital stay	Utilization rate	Average hospital stay	Utilization rate	Average hospital stay
	Cases	Days	Cases	Days	Cases	Days	Cases	Days
Accident, poisoning, and violence	4.0	4.3	12.4	6.4	15.1	7.8	43.5	9.8
Blood, and blood-forming organs	0.3	3.1	0.7	4.0	1.1	4.6	4.5	3.7
Certain causes of perinatal morbidity and mortality	1.8	8.3	0.0	0.0	0.0	0.0	0.0	0.0
Circulatory system	0.3	4.7	7.9	7.4	28.9	8.5	138.3	9.0
Congenital anomalies	1.2	5.7	1.0	4.8	1.0	8.2	1.9	5.0
Digestive system	2.3	4.0	15.3	7.1	26.9	8.2	85.1	8.5
Endocrine, nutritional, and metabolic	0.7	7.3	4.4	5.1	8.0	7.4	23.0	8.4
Genitourinary system	3.8	2.8	45.6	4.8	38.7	5.7	67.2	7.1
Infective, and parasitic	2.4	3.9	7.1	4.5	5.0	5.1	21.1	5.5
Maternity care	0.0	0.0	37.1	3.8	0.1	2.5	0.0	0.0
Mental disorders	0.2	12.9	7.2	11.1	7.6	11.1	15.4	10.0
Musculoskeletal system, and connective tissue	0.8	5.9	9.0	6.7	19.7	8.0	53.8	7.9
Neoplasms	0.5	4.1	14.1	5.8	28.8	8.7	82.6	8.8
Nervous system and sense organs	4.0	2.1	5.1	4.6	9.8	4.8	32.0	4.5
Respiratory system	7.5	3.7	19.2	4.4	27.4	6.7	90.9	7.9
Skin, and subcutaneous tissue	0.8	2.9	2.6	3.9	3.1	6.6	7.0	9.9
Symptoms, and ill-defined conditions	2.4	3.6	10.8	5.2	14.5	6.0	76.2	4.1
Tonsillectomy	9.4	1.6	5.3	2.5	0.2	3.4	0.6	5.0
Total	42.4	3.5	204.8	5.3	235.9	7.4	743.1	7.8

1/ Data courtesy of Oklahoma Blue Cross-Blue Shield. 2/ All numbers are rounded to nearest tenth.

3/ This age group consists of both minor dependents and policy contract holders.

system ailments is 0.4 (column 1, form 2) cases per thousand per year. In Alfalfa County, there are .944 thousand males ($944 = 944/1000 = .944$). Thus, $0.4 \times .944 = .38$ cases of circulatory system illness which can be expected each year for males under age 15 (entered in column 2).

In a similar manner, the estimated number of in-patient days can be calculated. The average length of stay for that same illness is 5 days (column 3, form 2). By multiplying the number of cases times the average length of stay ($.38 \times 5$, or column 2 times column 3), the number of in-patient days per year for that illness, sex, and age group is determined to be 1.9 (entered in column 4).

The total yearly cases and in-patient days for males under age 15 can be estimated by totaling columns 2 and 4, respectively, in form 2. For Alfalfa County, 48.72 cases (total column 2), with an average of 169.87 in-patient days (total column 4), are predicted for males under age 15.

The same procedure is used to determine cases and average stay for the other male age groups, and for females (form 3).

Form 4 summarizes the number of cases by disease and sex from forms 2 and 3, and form 5 summarizes the number of in-patient days. Forms 4 and 5 also provide the percentage of care by ailment which could be expected to be provided in the local hospital. These local-care percentages vary from one disease to another, but as with physicians, they are assumed to be 78.6 percent overall (8). Again, the other 21.4 percent would be handled by specialists outside the local area.

For instance, Alfalfa County could expect 48.04 infective and parasitic cases per year (form 4), with an average hospital stay of 235.94 days (form 5). It is estimated that the local hospital would treat 95.1 percent of these cases, or 45.69, with a total of 224.38 in-patient days required for treatment ($48.04 \times .951 = 45.69$; $235.94 \times .951 = 224.38$).

Continuing the illustration, there would be an estimated 185.83 cases involving neoplasms, with an average of 1,589.46 in-patient days per year. An estimated 35.3 percent of the cases, or 65.6, would be treated locally, requiring 561.08 in-patient days for treatment ($185.83 \times .353 = 65.6$; $1,589.46 \times .353 = 561.08$).

From all data on forms 4 and 5, 1,872.11 hospital cases and 13,040.15 in-patient days per year are estimated for Alfalfa County. Assuming that the projected 21.4 percent of the total cases required specialized treatment at urban health centers, the expected number of yearly cases and in-patient days for local treatment would be 1,469.24 and 10,186.08, respectively ($1,872.11 \times .786 = 1,469.24$; $13,040.15 \times .786 = 10,186.08$).

With information as to monthly and weekly variations in hospital utilization, in-patient bed days, percentage of hospital occupancy desired, and population growth estimates, the appropriate size of a new hospital or expansion of a present facility could be estimated.

If a local decisionmaker or planner is not interested in detailed information as to illnesses, and desires only estimated annual hospital cases and in-patient days, form 6 may be used. This form contains utilization rates and average hospital stays for males and females by age group. In Alfalfa County, the number of annual male and female cases are 703.4 and 1,168.67, respectively (column 3), totaling 1,872.07. Converting these to in-patient days, there are 4,756.55 for males and 8,361.80 for females (column 5), with a total stay of 13,118.35 days.

If 78.6 percent of the cases and in-patient days are projected for local care, then Alfalfa County residents would generate 1,471.45 local hospital cases and 10,311.02 in-patient days per year ($1,872.07 \times .786 = 1,471.45$; $13,118.35 \times .786 = 10,311.02$).

Again, numerical rounding of cases and in-patient days causes slightly different totals from one form to the next.

Emergency Rooms

Data from Hospital Utilization Report, 1976 (7) were used to derive an incidence rate for emergency room utilization. The data in this report (presented by substate planning districts) were obtained from a mail survey to all Oklahoma hospitals in 1974. Survey responses were received from 125 hospitals, which contained about 90 percent of the hospital beds in the State.

Only data for five substate districts are used to arrive at the rural emergency room utilization rate. The other substate districts either are metropolitan districts or contain long-term care facilities, and if used, would distort the utilization rate.

Dividing population data into the total emergency room visits yields a utilization rate defined as the number of visits per thousand population per year. For the five substate regions in Oklahoma, there were 221.4 visits per thousand residents in 1974.

Application

Local decisionmakers or health planners interested in estimating the need for an emergency room for a rural area can use the utilization rate derived. Alfalfa County, with its 7,224 residents, can expect 1,599 emergency room visits annually ($7.224 \times 221.4 = 1,599.39$).

Ambulances

Many county and community leaders in the Great Plains face the problem of how best to provide ambulance service to people in rural areas. To estimate usage of this service, information was obtained from patient flow data in eight counties in northwest Oklahoma (3).

Ambulance calls are divided into three categories: highway accident calls, transfers, and other medical calls. Highway accident calls include not only automobiles, but all other vehicles as well. Transfer calls are the movement of patients between hospitals. Some of the more common calls in the third category are for heart attacks, strokes, and home and industrial plant accidents.

Highway accidents which require ambulance service depend on such variables as population, density of population, highway miles, and highway conditions. The number of injury accidents last year is a good basis for estimating ambulance calls.

Ambulance calls for transferring patients between hospitals are a function of the size and services of the local hospital, the local medical staff, and other medical factors. Transfers can be estimated from records of ambulance operators and the local hospital.

Other medical calls also can be projected from ambulance and hospital records. As data available in the study are included the ambulance user's age, utilization rates by age groups were easily derived (form 7). Utilization rates are defined as the number of ambulance calls per thousand population per year.

By adding the estimated highway accident calls, transfer calls, and other medical calls, the total number of ambulance calls for a service area per year can be predicted. When the utilization rates are used with projected population growth figures, longer-range estimates also may be derived.

Application

Form 7 was devised to estimate ambulance calls for a service area. From highway patrol records, it is estimated that 31 ambulance calls will occur due to highway accidents during a year. Data from hospitals and ambulance operators suggest that 41 ambulance calls will arise from transferring patients from the local hospital to a regional health center, and 266 will arise from other medical calls.

If other medical calls by age group are desired, multiply the utilization rates times the number of residents per thousand in each age group. For example, 3.23 calls per thousand may be expected for residents under age 20. For Alfalfa County residents under age 20, there would be 7.04 other medical calls per year ($2.179 \times 3.23 = 7.04$).

Total ambulance calls in Alfalfa County for the year would be 338 ($31 + 41 + 226 = 338$).

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APPENDIX A

Illustrations for Predicting Local Health Service Needs

Form 1--Annual physician visits for service area: Alfalfa County, Okla.

Age group	Male			Female			(7) Total male and female visits (3) + (6)
	(1) Utili- zation rate <u>1/</u>	(2) Popula- tion	(3) Total visits (1)x(2)	(4) Utili- zation rate <u>1/</u>	(5) Popula- tion	(6) Total visits (4)x(5)	
Under 15 years old	3.3	<u>944</u>	<u>3,115.2</u>	2.8	<u>737</u>	<u>2,063.6</u>	<u>5,178.8</u>
15-44 years old	2.3	<u>1,033</u>	<u>2,375.9</u>	4.1	<u>1,028</u>	<u>4,214.8</u>	<u>6,590.7</u>
45-64 years old	3.3	<u>899</u>	<u>2,966.7</u>	4.2	<u>987</u>	<u>4,145.4</u>	<u>7,112.1</u>
65 years old & over	4.8	<u>662</u>	<u>3,177.6</u>	6.0	<u>934</u>	<u>5,604.0</u>	<u>8,781.6</u>
Total		<u>3,538</u>	<u>11,635.4</u>		<u>3,686</u>	<u>16,027.8</u>	<u>27,663.2</u>

Visits to local practitioners:	<u>27,663.2</u>		(total visits) x 78.6 percent =		<u>21,743.28</u>		
Visits to specialists:	<u>27,663.2</u>		(total visits) x 21.4 percent =		<u>5,919.92</u>		
Local physicians needed:	<u>21,743.28</u>		(local visits) ÷ 3,900 =		<u>5.58</u> <u>2/</u>		

1/ Data from table 1.

2/ It is estimated that a physician can handle at least 3,900 patient encounters per year (8).

Form 2--Annual male hospital cases and in-patient days for: Alfalfa County, Okla.

Illness classification	Under 15 (1,000 pop.) <u>944</u>				15-44 (1,000 pop.) <u>1,033</u>			
	(1) Utili- zation rate <u>1/</u>	(2) Cases (1) x pop.	(3) Average hospital stay <u>1/</u>	(4) In- patient days: (2)x(3)	(5) Utili- zation rate <u>1/</u>	(6) Cases (5) x pop.	(7) Average hospital stay <u>1/</u>	(8) In- patient days: (6)x(7)
Accident, poisoning, and violence	6.2	<u>5.85</u>	3.9	<u>22.82</u>	12.4	<u>12.81</u>	5.3	<u>67.89</u>
Blood, and blood-forming organs	0.6	<u>0.57</u>	3.9	<u>2.22</u>	0.4	<u>0.41</u>	4.7	<u>1.93</u>
Certain causes of perinatal morbidity and mortality	1.9	<u>1.79</u>	9.1	<u>16.29</u>	0.0	<u>0.00</u>	0.0	<u>0.00</u>
Circulatory system	0.4	<u>0.38</u>	5.0	<u>1.90</u>	5.9	<u>6.09</u>	6.1	<u>37.15</u>
Congenital anomalies	2.1	<u>1.98</u>	4.9	<u>9.70</u>	0.7	<u>0.72</u>	5.6	<u>4.03</u>
Digestive system	4.3	<u>4.06</u>	3.4	<u>13.80</u>	9.5	<u>9.81</u>	5.6	<u>54.94</u>
Endocrine, nutritional, and metabolic	0.5	<u>0.47</u>	4.1	<u>1.93</u>	1.7	<u>1.76</u>	5.2	<u>9.15</u>
Genitourinary system	2.5	<u>2.36</u>	2.6	<u>6.14</u>	8.7	<u>8.99</u>	3.5	<u>31.47</u>
Infective, and parasitic	3.0	<u>2.83</u>	3.7	<u>10.47</u>	3.8	<u>3.93</u>	4.4	<u>17.29</u>
Maternity care	0.0	<u>0.00</u>	0.0	<u>0.00</u>	0.0	<u>0.00</u>	0.0	<u>0.00</u>
Mental disorders	0.4	<u>0.38</u>	15.6	<u>5.93</u>	4.2	<u>4.34</u>	10.0	<u>43.40</u>
Musculoskeletal system, and connective tissue	0.8	<u>0.76</u>	4.3	<u>3.26</u>	7.6	<u>7.85</u>	6.2	<u>48.67</u>
Neoplasms	0.7	<u>0.66</u>	4.4	<u>2.90</u>	2.7	<u>2.79</u>	5.0	<u>13.95</u>
Nervous system and sense organs	5.4	<u>5.10</u>	2.5	<u>12.75</u>	3.1	<u>3.20</u>	5.8	<u>18.56</u>
Respiratory system	10.4	<u>9.82</u>	3.6	<u>35.35</u>	13.3	<u>13.74</u>	4.1	<u>56.33</u>
Skin, and subcutaneous tissue	0.9	<u>0.85</u>	3.1	<u>2.64</u>	2.6	<u>2.69</u>	4.9	<u>13.18</u>
Symptoms, and ill-defined conditions	2.9	<u>2.74</u>	3.2	<u>8.77</u>	5.4	<u>5.58</u>	4.1	<u>22.88</u>
Tonsillectomy	8.6	<u>8.12</u>	1.6	<u>12.99</u>	1.9	<u>1.96</u>	2.6	<u>5.10</u>
Total		<u>48.72</u>		<u>169.87</u>		<u>86.67</u>		<u>445.92</u>

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Footnote at end of table.

Continued--

Form 2 (cont.)--Annual male hospital cases and in-patient days for: Alfalfa County, Okla.

Illness classification	45-64 (1,000 pop.) <u>.899</u>				65+ (1,000 pop.) <u>.662</u>			
	(9) Utilization rate <u>1/</u>	(10) Cases (9) x pop.	(11) Average hospital stay <u>1/</u>	(12) In-patient days: (10)x(11)	(13) Utilization rate <u>1/</u>	(14) Cases (13) x pop.	(15) Average hospital stay <u>1/</u>	(16) In-patient days: (14)x(15)
Accident, poisoning, and violence	12.8	<u>11.51</u>	6.5	<u>74.82</u>	27.4	<u>18.14</u>	7.8	<u>141.49</u>
Blood, and blood-forming organs	0.8	<u>.72</u>	6.4	<u>4.61</u>	2.0	<u>1.32</u>	5.7	<u>7.52</u>
Certain causes of perinatal morbidity and mortality	0.0	<u>0.00</u>	0.0	<u>0.00</u>	0.0	<u>0.00</u>	0.0	<u>0.00</u>
Circulatory system	40.6	<u>36.50</u>	8.7	<u>317.55</u>	154.8	<u>102.48</u>	8.8	<u>901.82</u>
Congenital anomalies	1.3	<u>1.17</u>	8.8	<u>10.30</u>	1.4	<u>.93</u>	3.5	<u>3.26</u>
Digestive system	24.9	<u>22.39</u>	6.8	<u>152.25</u>	58.2	<u>38.53</u>	7.6	<u>292.83</u>
Endocrine, nutritional, and metabolic	4.2	<u>3.78</u>	6.9	<u>26.08</u>	12.3	<u>8.14</u>	7.2	<u>58.61</u>
Genitourinary system	18.3	<u>16.45</u>	5.4	<u>88.83</u>	58.9	<u>38.99</u>	6.2	<u>241.74</u>
Infective, and parasitic	3.4	<u>3.06</u>	5.5	<u>16.83</u>	6.8	<u>4.50</u>	4.0	<u>18.00</u>
Maternity care	0.0	<u>0.00</u>	0.0	<u>0.00</u>	0.0	<u>0.00</u>	0.0	<u>0.00</u>
Mental disorders	5.5	<u>4.94</u>	9.1	<u>44.95</u>	15.1	<u>10.00</u>	10.8	<u>108.00</u>
Musculoskeletal system, and connective tissue	13.1	<u>11.78</u>	7.1	<u>83.64</u>	20.5	<u>13.57</u>	8.4	<u>113.99</u>
Neoplasms	14.4	<u>12.95</u>	8.5	<u>110.08</u>	74.0	<u>48.99</u>	9.2	<u>450.71</u>
Nervous system and sense organs	8.2	<u>7.37</u>	5.2	<u>38.32</u>	25.3	<u>16.75</u>	2.9	<u>48.58</u>
Respiratory system	26.5	<u>23.82</u>	6.0	<u>142.92</u>	86.3	<u>57.13</u>	7.5	<u>428.48</u>
Skin, and subcutaneous tissue	2.4	<u>2.16</u>	4.6	<u>9.94</u>	4.1	<u>2.71</u>	7.8	<u>21.14</u>
Symptoms, and ill-defined conditions	11.6	<u>10.43</u>	5.4	<u>56.32</u>	55.5	<u>36.74</u>	2.8	<u>102.87</u>
Tonsillectomy	0.1	<u>0.09</u>	5.0	<u>0.45</u>	0.0	<u>0.00</u>	0.0	<u>0.00</u>
Total		<u>169.12</u>		<u>1,177.89</u>		<u>398.92</u>		<u>2,939.04</u>

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1/ Data are from table 2.

Form 3--Annual female hospital cases and in-patient days for: Alfalfa County, Okla.

Illness classification	Under 15 (1,000 pop.) <u>.737</u>				15-44 (1,000 pop.) <u>1.028</u>			
	(1) Utili- zation rate <u>1/</u>	(2) Cases (1) x pop.	(3) Average hospital stay <u>1/</u>	(4) In- patient days: (2)x(3)	(5) Utili- zation rate <u>1/</u>	(6) Cases (5) x pop.	(7) Average hospital stay <u>1/</u>	(8) In- patient days: (6)x(7)
Accident, poisoning, and violence	4.0	<u>2.95</u>	4.3	<u>12.69</u>	12.4	<u>12.75</u>	6.4	<u>81.60</u>
Blood, and blood-forming organs	0.3	<u>0.22</u>	3.1	<u>0.68</u>	0.7	<u>0.72</u>	4.0	<u>2.88</u>
Certain causes of perinatal morbidity and mortality	1.8	<u>1.33</u>	8.3	<u>11.04</u>	0.0	<u>0.00</u>	0.0	<u>0.00</u>
Circulatory system	0.3	<u>0.22</u>	4.7	<u>1.03</u>	7.9	<u>8.12</u>	7.4	<u>60.09</u>
Congenital anomalies	1.2	<u>.88</u>	5.7	<u>5.02</u>	1.0	<u>1.03</u>	4.8	<u>4.94</u>
Digestive system	2.3	<u>1.70</u>	4.0	<u>6.80</u>	15.3	<u>15.73</u>	7.1	<u>111.68</u>
Endocrine, nutritional, and metabolic	0.7	<u>0.52</u>	7.3	<u>3.80</u>	4.4	<u>4.52</u>	5.1	<u>23.05</u>
Genitourinary system	3.8	<u>2.80</u>	2.8	<u>7.84</u>	45.6	<u>46.88</u>	4.8	<u>225.02</u>
Infective, and parasitic	2.4	<u>1.77</u>	3.9	<u>6.90</u>	7.1	<u>7.30</u>	4.5	<u>32.85</u>
Maternity care	0.0	<u>0.00</u>	0.0	<u>0.00</u>	37.1	<u>38.14</u>	3.8	<u>144.93</u>
Mental disorders	0.2	<u>0.15</u>	12.9	<u>1.94</u>	7.2	<u>7.40</u>	11.1	<u>82.14</u>
Musculoskeletal system, and connective tissue	0.8	<u>.59</u>	5.9	<u>3.48</u>	9.0	<u>9.25</u>	6.7	<u>61.98</u>
Neoplasms	0.5	<u>.37</u>	4.1	<u>1.52</u>	14.1	<u>14.49</u>	5.8	<u>84.04</u>
Nervous system and sense organs	4.0	<u>2.95</u>	2.1	<u>6.20</u>	5.1	<u>5.24</u>	4.6	<u>24.10</u>
Respiratory system	7.5	<u>5.53</u>	3.7	<u>20.46</u>	19.2	<u>19.74</u>	4.4	<u>86.86</u>
Skin, and subcutaneous tissue	0.8	<u>.59</u>	2.9	<u>1.71</u>	2.6	<u>2.67</u>	3.9	<u>10.41</u>
Symptoms, and ill-defined conditions	2.4	<u>1.77</u>	3.6	<u>6.37</u>	10.8	<u>11.10</u>	5.2	<u>57.72</u>
Tonsillectomy	9.4	<u>6.93</u>	1.6	<u>11.09</u>	5.3	<u>5.45</u>	2.5	<u>13.63</u>
Total		<u>31.27</u>		<u>108.57</u>		<u>210.53</u>		<u>1107.92</u>

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Footnote at end of table.

Continued--

Form 3 (cont.)--Annual female hospital cases and in-patient days for: Alfalfa County, Okla.

Illness classification	45-64 (1,000 pop.) <u>987</u>				65+ (1,000 pop.) <u>934</u>			
	(9) Utili- zation rate <u>1/</u>	(10) Cases (9) x pop.	(11) Average hospital stay <u>1/</u>	(12) In- patient days: (10)x(11)	(13) Utili- zation rate <u>1/</u>	(14) Cases (13) x pop.	(15) Average hospital stay <u>1/</u>	(16) In- patient days: (14)x(15)
Accident, poisoning, and violence	15.1	<u>14.90</u>	7.8	<u>116.22</u>	43.5	<u>40.63</u>	9.8	<u>398.17</u>
Blood, and blood-forming organs	1.1	<u>1.09</u>	4.6	<u>5.01</u>	4.5	<u>4.20</u>	3.7	<u>15.54</u>
Certain causes of perinatal morbidity and mortality	0.0	<u>0.00</u>	0.0	<u>0.00</u>	0.0	<u>0.00</u>	0.0	<u>0.00</u>
Circulatory system	28.9	<u>28.52</u>	8.5	<u>242.42</u>	138.3	<u>129.17</u>	9.0	<u>1162.53</u>
Congenital anomalies	1.0	<u>.99</u>	8.2	<u>8.12</u>	1.9	<u>1.77</u>	5.0	<u>8.85</u>
Digestive system	26.9	<u>26.55</u>	8.2	<u>217.71</u>	85.1	<u>79.48</u>	8.5	<u>675.58</u>
Endocrine, nutritional, and metabolic	8.0	<u>7.90</u>	7.4	<u>58.46</u>	23.0	<u>21.48</u>	8.4	<u>180.43</u>
Genitourinary system	38.7	<u>38.20</u>	5.7	<u>217.74</u>	67.2	<u>62.76</u>	7.1	<u>445.60</u>
Infective, and parasitic	5.0	<u>4.94</u>	5.1	<u>25.19</u>	21.1	<u>19.71</u>	5.5	<u>108.41</u>
Maternity care	0.1	<u>.10</u>	2.5	<u>.25</u>	0.0	<u>0.00</u>	0.0	<u>0.00</u>
Mental disorders	7.6	<u>7.50</u>	11.1	<u>83.25</u>	15.4	<u>14.38</u>	10.0	<u>143.80</u>
Musculoskeletal system, and connective tissue	19.7	<u>19.44</u>	8.0	<u>155.52</u>	53.8	<u>50.25</u>	7.9	<u>396.98</u>
Neoplasms	28.8	<u>28.43</u>	8.7	<u>247.34</u>	82.6	<u>77.15</u>	8.8	<u>678.92</u>
Nervous system and sense organs	9.8	<u>9.67</u>	4.8	<u>46.42</u>	32.0	<u>29.89</u>	4.5	<u>134.51</u>
Respiratory system	27.4	<u>27.04</u>	6.7	<u>181.17</u>	90.9	<u>84.90</u>	7.9	<u>670.71</u>
Skin, and subcutaneous tissue	3.1	<u>3.06</u>	6.6	<u>20.20</u>	7.0	<u>6.54</u>	9.9	<u>64.75</u>
Symptoms, and ill-defined conditions	14.5	<u>14.31</u>	6.0	<u>85.86</u>	76.2	<u>71.17</u>	4.1	<u>291.80</u>
Tonsillectomy	0.2	<u>.20</u>	3.4	<u>.68</u>	0.6	<u>.56</u>	5.0	<u>2.80</u>
Total		<u>232.84</u>		<u>1711.56</u>		<u>694.04</u>		<u>5379.38</u>

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1/ Data are from table 3.

Form 4--Summary of hospital cases for: Alfalfa County, Okla.

Illness classification	Cases			Percent care	Total local cases
	Male <u>1/</u>	Female <u>2/</u>	Total		
Accident, poisoning, and violence	<u>48.31</u>	<u>71.23</u>	<u>119.54</u> x	.666	= <u>79.61</u>
Blood, and blood-forming organs	<u>3.02</u>	<u>6.23</u>	<u>9.25</u> x	.999	= <u>9.24</u>
Certain causes of perinatal morbidity and mortality	<u>1.79</u>	<u>1.33</u>	<u>3.12</u> x	1.000	= <u>3.12</u>
Circulatory system	<u>145.45</u>	<u>166.03</u>	<u>311.48</u> x	.964	= <u>300.27</u>
Congenital anomalies	<u>4.80</u>	<u>4.67</u>	<u>9.47</u> x	.539	= <u>5.10</u>
Digestive system	<u>74.79</u>	<u>123.46</u>	<u>198.25</u> x	.818	= <u>162.17</u>
Endocrine, nutritional, and metabolic	<u>14.15</u>	<u>34.42</u>	<u>48.57</u> x	.979	= <u>47.55</u>
Genitourinary system	<u>66.79</u>	<u>150.64</u>	<u>217.43</u> x	.670	= <u>145.68</u>
Infective, and parasitic	<u>14.32</u>	<u>33.72</u>	<u>48.04</u> x	.951	= <u>45.69</u>
Maternity care	<u>0.00</u>	<u>38.24</u>	<u>38.24</u> x	.902	= <u>34.49</u>
Mental disorders	<u>19.66</u>	<u>29.43</u>	<u>49.09</u> x	.993	= <u>48.75</u>
Musculoskeletal system, and connective tissue	<u>33.96</u>	<u>79.53</u>	<u>113.49</u> x	.689	= <u>78.19</u>
Neoplasms	<u>65.39</u>	<u>120.44</u>	<u>185.83</u> x	.353	= <u>65.60</u>
Nervous system and sense organs	<u>32.42</u>	<u>47.75</u>	<u>80.17</u> x	.601	= <u>48.18</u>
Respiratory system	<u>104.51</u>	<u>137.21</u>	<u>241.72</u> x	.873	= <u>211.02</u>
Skin, and subcutaneous tissue	<u>8.41</u>	<u>12.86</u>	<u>21.27</u> x	.776	= <u>16.51</u>
Symptoms, and ill-defined conditions	<u>55.43</u>	<u>98.35</u>	<u>153.84</u> x	.941	= <u>144.76</u>
Tonsillectomy	<u>10.17</u>	<u>13.14</u>	<u>23.31</u> x	1.000	= <u>23.31</u>
Total	<u>703.43</u>	<u>1,168.68</u>	<u>1,872.11</u> x	.786	= <u>1,469.24</u>

1/ Total of columns (2), (6), (10), and (14), form 2, for each disease.

2/ Total of columns (2), (6), (10), and (14), form 3, for each disease.

Form 5--Summary of in-patient days for: Alfalfa County, OKla.

Illness classification	In-patient days			Percent local care	Total local in-patient days
	Male <u>1/</u>	Female <u>2/</u>	Total		
Accident, poisoning, and violence	<u>307.02</u>	<u>608.68</u>	<u>915.70</u>	x .666	= <u>609.86</u>
Blood, and blood-forming organs	<u>16.28</u>	<u>24.11</u>	<u>40.39</u>	x .999	= <u>40.35</u>
Certain causes of perinatal morbidity and mortality	<u>16.29</u>	<u>11.04</u>	<u>27.33</u>	x 1.000	= <u>27.33</u>
Circulatory system	<u>1,258.42</u>	<u>1,416.07</u>	<u>2,724.49</u>	x .964	= <u>2,626.41</u>
Congenital anomalies	<u>27.29</u>	<u>26.93</u>	<u>54.22</u>	x .539	= <u>29.22</u>
Digestive system	<u>513.82</u>	<u>1,011.77</u>	<u>1,525.59</u>	x .818	= <u>1,249.93</u>
Endocrine, nutritional, and metabolic	<u>95.77</u>	<u>267.74</u>	<u>361.51</u>	x .979	= <u>353.92</u>
Genitourinary system	<u>368.18</u>	<u>896.20</u>	<u>1,264.38</u>	x .670	= <u>847.12</u>
Infective, and parasitic	<u>62.59</u>	<u>173.35</u>	<u>235.94</u>	x .951	= <u>224.38</u>
Maternity care	<u>0.00</u>	<u>145.18</u>	<u>145.18</u>	x .902	= <u>130.95</u>
Mental disorders	<u>202.28</u>	<u>311.13</u>	<u>513.41</u>	x .993	= <u>519.82</u>
Musculoskeletal system, and connective tissue	<u>249.57</u>	<u>617.96</u>	<u>867.53</u>	x .689	= <u>597.73</u>
Neoplasms	<u>577.64</u>	<u>1,011.82</u>	<u>1,589.46</u>	x .353	= <u>561.08</u>
Nervous system and sense organs	<u>118.21</u>	<u>211.23</u>	<u>329.44</u>	x .601	= <u>197.99</u>
Respiratory system	<u>663.08</u>	<u>959.20</u>	<u>1,622.28</u>	x .873	= <u>1,416.25</u>
Skin, and subcutaneous tissue	<u>46.90</u>	<u>97.07</u>	<u>143.97</u>	x .776	= <u>111.72</u>
Symptoms, and ill-defined conditions	<u>190.84</u>	<u>441.75</u>	<u>632.59</u>	x .941	= <u>595.27</u>
Tonsillectomy	<u>18.54</u>	<u>28.20</u>	<u>46.74</u>	x 1.000	= <u>46.74</u>
Total	<u>4,732.72</u>	<u>8,307.43</u>	<u>13,040.15</u>	x .786	= <u>10,186.08</u>

1/ Total of columns (4), (8), (12), and (16), form 2, for each disease.

2/ Total of columns (4), (8), (12), and (16), form 3, for each disease.

Form 6--Aggregate hospital cases and in-patient days for: Alfalfa County, Ok.

Age group	(1) Utilization rate	(2) - 1,000 population	(3) Cases: (1) x (2)	(4) Average stay	(5) In-patient days (3) x (4)
Male:					
Under 15	51.6	<u>.944</u>	<u>48.71</u>	3.5	<u>170.49</u>
15-44	83.9	<u>1.033</u>	<u>86.67</u>	5.2	<u>450.16</u>
45-64	188.1	<u>.899</u>	<u>169.10</u>	7.0	<u>1,183.89</u>
65+	602.6	<u>.662</u>	<u>398.92</u>	7.4	<u>2,952.01</u>
Total			<u>703.40</u>		<u>4,756.55</u>
Female:					
Under 15	42.4	<u>.737</u>	<u>31.25</u>	3.5	<u>109.38</u>
15-44	204.8	<u>1.028</u>	<u>210.53</u>	5.3	<u>1,115.81</u>
45-64	235.9	<u>.987</u>	<u>232.83</u>	7.4	<u>1,722.94</u>
65+	743.1	<u>.934</u>	<u>694.06</u>	7.8	<u>5,413.67</u>
Total			<u>1,168.67</u>		<u>8,361.80</u>
Total:					
Under 15			<u>79.96</u>		<u>297.87</u>
15-44			<u>297.20</u>		<u>1,565.97</u>
45-64			<u>401.93</u>		<u>2,906.83</u>
65+			<u>1,092.98</u>		<u>8,365.68</u>
Total			<u>1,872.07</u>		<u>13,118.35</u>

Local care cases:	<u>1,872.07</u> (total cases) x 78.6 percent = <u>1,471.45</u>				
Local in-patient days:	<u>13,118.35</u> (total days) x 78.6 percent = <u>10,311.02</u>				

Form 7--Calls for ambulance service for: Alfalfa County, Okla.

Type of call for ambulance service		:	Number
Highway accidents (obtained from highway patrol records):		:	<u>31</u>
Transfers (obtained from ambulance and hospital records):		:	<u>41</u>
Other medical calls (obtained from ambulance and hospital records): <u>1/</u>		:	<u> </u>
Other medical calls by age group: <u>1/</u>			
<u>Age group</u>	<u>1,000 pop. by age group</u>	<u>Annual calls per 1,000 pop. per age group</u>	<u>Total annual calls per age group</u>
Under 20	<u>2.179</u>	3.23	<u>7.04</u>
20-29	<u>.553</u>	10.66	<u>5.89</u>
30-39	<u>.626</u>	11.29	<u>7.07</u>
40-49	<u>.785</u>	8.81	<u>6.92</u>
50-59	<u>.967</u>	21.15	<u>20.45</u>
60-69	<u>1.013</u>	37.81	<u>38.30</u>
70-79	<u>.740</u>	137.87	<u>102.02</u>
Over 80	<u>.361</u>	216.95	<u>78.32</u>
Total			<u>266.01</u> <u>266</u>
		Total calls	<u>338</u>

1/ Either of these two methods may be used.

APPENDIX B

Blank Forms For Local Use

Form 1--Annual physician visits for service area: _____

Age group	Male			Female			(7)
	(1) Utili- zation rate <u>1/</u>	(2) Popula- tion	(3) Total visits (1)x(2)	(4) Utili- zation rate <u>1/</u>	(5) Popula- tion	(6) Total visits (4)x(5)	Total male and female visits (3) + (6)
Under 15 years old	3.3	_____	_____	2.8	_____	_____	_____
15-44 years old	2.3	_____	_____	4.1	_____	_____	_____
45-64 years old	3.3	_____	_____	4.2	_____	_____	_____
65 years old & over	4.8	_____	_____	6.0	_____	_____	_____
Total		_____	_____		_____	_____	_____

Visits to local practitioners: _____ (total visits) x 78.6 percent = _____

Visits to specialists: _____ (total visits) x 21.4 percent = _____

Local physicians needed: _____ (local visits) ÷ 3,900 = _____ 2/

1/ Data from table 1.

2/ It is estimated that a physician can handle at least 3,900 patient encounters per year (8).

Form 2--Annual male hospital cases and in-patient days for: _____

Illness classification	Under 15 (1,000 pop.) _____				15-44 (1,000 pop.) _____			
	(1) Utili- zation rate <u>1</u> / :	(2) Cases (1) x pop. :	(3) Average hospital stay <u>1</u> / :	(4) In- patient days: (2)x(3) :	(5) Utili- zation rate <u>1</u> / :	(6) Cases (5) x pop. :	(7) Average hospital stay <u>1</u> / :	(8) In- patient days: (6)x(7) :
Accident, poisoning, and violence	6.2	_____	3.9	_____	12.4	_____	5.3	_____
Blood, and blood-forming organs	0.6	_____	3.9	_____	0.4	_____	4.7	_____
Certain causes of perinatal morbidity and mortality	1.9	_____	9.1	_____	0.0	_____	0.0	_____
Circulatory system	0.4	_____	5.0	_____	5.9	_____	6.1	_____
Congenital anomalies	2.1	_____	4.9	_____	0.7	_____	5.6	_____
Digestive system	4.3	_____	3.4	_____	9.5	_____	5.6	_____
Endocrine, nutritional, and metabolic	0.5	_____	4.1	_____	1.7	_____	5.2	_____
Genitourinary system	2.5	_____	2.6	_____	8.7	_____	3.5	_____
Infective, and parasitic	3.0	_____	3.7	_____	3.8	_____	4.4	_____
Maternity care	0.0	_____	0.0	_____	0.0	_____	0.0	_____
Mental disorders	0.4	_____	15.6	_____	4.2	_____	10.0	_____
Musculoskeletal system, and connective tissue	0.8	_____	4.3	_____	7.6	_____	6.2	_____
Neoplasms	0.7	_____	4.4	_____	2.7	_____	5.0	_____
Nervous system and sense organs	5.4	_____	2.5	_____	3.1	_____	5.8	_____
Respiratory system	10.4	_____	3.6	_____	13.3	_____	4.1	_____
Skin, and subcutaneous tissue	0.9	_____	3.1	_____	2.6	_____	4.9	_____
Symptoms, and ill-defined conditions	2.9	_____	3.2	_____	5.4	_____	4.1	_____
Tonsillectomy	8.6	_____	1.6	_____	1.9	_____	2.6	_____
Total		_____		_____		_____		_____

Footnote at end of table.

Continued--

Form 2 (cont.)--Annual male hospital cases and in-patient days for: _____

Illness classification	45-64 (1,000 pop.) _____				65+ (1,000 pop.) _____			
	(9) Utili- zation rate <u>1/</u>	(10) Cases (9) x pop.	(11) Average hospital stay <u>1/</u>	(12) In- patient days: (10)x(11)	(13) Utili- zation rate <u>1/</u>	(14) Cases (13) x pop.	(15) Average hospital stay <u>1/</u>	(16) In- patient days: (14)x(15)
Accident, poisoning, and violence	12.8	_____	6.5	_____	27.4	_____	7.8	_____
Blood, and blood-forming organs	0.8	_____	6.4	_____	2.0	_____	5.7	_____
Certain causes of perinatal morbidity and mortality	0.0	_____	0.0	_____	0.0	_____	0.0	_____
Circulatory system	40.6	_____	8.7	_____	154.8	_____	8.8	_____
Congenital anomalies	1.3	_____	8.8	_____	1.4	_____	3.5	_____
Digestive system	24.9	_____	6.8	_____	58.2	_____	7.6	_____
Endocrine, nutritional, and metabolic	4.2	_____	6.9	_____	12.3	_____	7.2	_____
Genitourinary system	18.3	_____	5.4	_____	58.9	_____	6.2	_____
Infective, and parasitic	3.4	_____	5.5	_____	6.8	_____	4.0	_____
Maternity care	0.0	_____	0.0	_____	0.0	_____	0.0	_____
Mental disorders	5.5	_____	9.1	_____	15.1	_____	10.8	_____
Musculoskeletal system, and connective tissue	13.1	_____	7.1	_____	20.5	_____	8.4	_____
Neoplasms	14.4	_____	8.5	_____	74.0	_____	9.2	_____
Nervous system and sense organs	8.2	_____	5.2	_____	25.3	_____	2.9	_____
Respiratory system	26.5	_____	6.0	_____	86.3	_____	7.5	_____
Skin, and subcutaneous tissue	2.4	_____	4.6	_____	4.1	_____	7.8	_____
Symptoms, and ill-defined conditions	11.6	_____	5.4	_____	55.5	_____	2.8	_____
Tonsillectomy	0.1	_____	5.0	_____	0.0	_____	0.0	_____
Total		_____		_____		_____		_____

1/ Data are from table 2.

Form 3--Annual female hospital cases and in-patient days for: _____

Illness classification	Under 15 (1,000 pop.) _____				15-44 (1,000 pop.) _____			
	(1) Utili- zation rate <u>1</u> / pop.	(2) Cases (1) x pop.	(3) Average hospital stay <u>1</u> / pop.	(4) In- patient days: (2)x(3)	(5) Utili- zation rate <u>1</u> / pop.	(6) Cases (5) x pop.	(7) Average hospital stay <u>1</u> / pop.	(8) In- patient days: (6)x(7)
Accident, poisoning, and violence	4.0	_____	4.3	_____	12.4	_____	6.4	_____
Blood, and blood-forming organs	0.3	_____	3.1	_____	0.7	_____	4.0	_____
Certain causes of perinatal morbidity and mortality	1.8	_____	8.3	_____	0.0	_____	0.0	_____
Circulatory system	0.3	_____	4.7	_____	7.9	_____	7.4	_____
Congenital anomalies	1.2	_____	5.7	_____	1.0	_____	4.8	_____
Digestive system	2.3	_____	4.0	_____	15.3	_____	7.1	_____
Endocrine, nutritional, and metabolic	0.7	_____	7.3	_____	4.4	_____	5.1	_____
Genitourinary system	3.8	_____	2.8	_____	45.6	_____	4.8	_____
Infective, and parasitic	2.4	_____	3.9	_____	7.1	_____	4.5	_____
Maternity care	0.0	_____	0.0	_____	37.1	_____	3.8	_____
Mental disorders	0.2	_____	12.9	_____	7.2	_____	11.1	_____
Musculoskeletal system, and connective tissue	0.8	_____	5.9	_____	9.0	_____	6.7	_____
Neoplasms	0.5	_____	4.1	_____	14.1	_____	5.8	_____
Nervous system and sense organs	4.0	_____	2.1	_____	5.1	_____	4.6	_____
Respiratory system	7.5	_____	3.7	_____	19.2	_____	4.4	_____
Skin, and subcutaneous tissue	0.8	_____	2.9	_____	2.6	_____	3.9	_____
Symptoms, and ill-defined conditions	2.4	_____	3.6	_____	10.8	_____	5.2	_____
Tonsillectomy	9.4	_____	1.6	_____	5.3	_____	2.5	_____
Total		_____		_____		_____		_____

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Form 3 (cont.)--Annual female hospital cases and in-patient days for: _____

Illness classification	45-64 (1,000 pop.)				65+ (1,000 pop.)			
	(9) Utili- zation rate <u>1</u> / :	(10) Cases (9) x pop. :	(11) Average hospital stay <u>1</u> / :	(12) In- patient days: (10)x(11) :	(13) Utili- zation rate <u>1</u> / :	(14) Cases (13) x pop. :	(15) Average hospital stay <u>1</u> / :	(16) In- patient days: (14)x(15) :
Accident, poisoning, and violence	15.1	_____	7.8	_____	43.5	_____	9.8	_____
Blood, and blood-forming organs	1.1	_____	4.6	_____	4.5	_____	3.7	_____
Certain causes of perinatal morbidity and mortality	0.0	_____	0.0	_____	0.0	_____	0.0	_____
Circulatory system	28.9	_____	8.5	_____	138.3	_____	9.0	_____
Congenital anomalies	1.0	_____	8.2	_____	1.9	_____	5.0	_____
Digestive system	26.9	_____	8.2	_____	85.1	_____	8.5	_____
Endocrine, nutritional, and metabolic	8.0	_____	7.4	_____	23.0	_____	8.4	_____
Genitourinary system	38.7	_____	5.7	_____	67.2	_____	7.1	_____
Infective, and parasitic	5.0	_____	5.1	_____	21.1	_____	5.5	_____
Maternity care	0.1	_____	2.5	_____	0.0	_____	0.0	_____
Mental disorders	7.6	_____	11.1	_____	15.4	_____	10.0	_____
Musculoskeletal system, and connective tissue	19.7	_____	8.0	_____	53.8	_____	7.9	_____
Neoplasms	28.8	_____	8.7	_____	82.6	_____	8.8	_____
Nervous system and sense organs	9.8	_____	4.8	_____	32.0	_____	4.5	_____
Respiratory system	27.4	_____	6.7	_____	90.9	_____	7.9	_____
Skin, and subcutaneous tissue	3.1	_____	6.6	_____	7.0	_____	9.9	_____
Symptoms, and ill-defined conditions	14.5	_____	6.0	_____	76.2	_____	4.1	_____
Tonsillectomy	0.2	_____	3.4	_____	0.6	_____	5.0	_____
Total		_____		_____		_____		_____

1/ Data are from table 3.

Form 4--Summary of hospital cases for: _____

Illness classification	Cases			Percent local care	Total local cases
	Male <u>1/</u>	Female <u>2/</u>	Total		
Accident, poisoning, and violence	_____	_____	_____	x .666	= _____
Blood, and blood-forming organs	_____	_____	_____	x .999	= _____
Certain causes of perinatal morbidity and mortality	_____	_____	_____	x 1.000	= _____
Circulatory system	_____	_____	_____	x .964	= _____
Congenital anomalies	_____	_____	_____	x .539	= _____
Digestive system	_____	_____	_____	x .818	= _____
Endocrine, nutritional, and metabolic	_____	_____	_____	x .979	= _____
Genitourinary system	_____	_____	_____	x .670	= _____
Infective, and parasitic	_____	_____	_____	x .951	= _____
Maternity care	_____	_____	_____	x .902	= _____
Mental disorders	_____	_____	_____	x .993	= _____
Musculoskeletal system, and connective tissue	_____	_____	_____	x .689	= _____
Neoplasms	_____	_____	_____	x .353	= _____
Nervous system and sense organs	_____	_____	_____	x .601	= _____
Respiratory system	_____	_____	_____	x .873	= _____
Skin, and subcutaneous tissue	_____	_____	_____	x .776	= _____
Symptoms, and ill-defined conditions	_____	_____	_____	x .941	= _____
Tonsillectomy	_____	_____	_____	x 1.000	= _____
Total	_____	_____	_____	x .786	= _____

1/ Total of columns (2), (6), (10), and (14), form 2, for each disease.

2/ Total of columns (2), (6), (10), and (14), form 3, for each disease.

Form 5--Summary of in-patient days for: _____

Illness classification	In-patient days			Percent local care	Total local in-patient days
	Male <u>1/</u>	Female <u>2/</u>	Total		
Accident, poisoning, and violence	_____	_____	_____	x .666	= _____
Blood, and blood-forming organs	_____	_____	_____	x .999	= _____
Certain causes of perinatal morbidity and mortality	_____	_____	_____	x 1.000	= _____
Circulatory system	_____	_____	_____	x .964	= _____
Congenital anomalies	_____	_____	_____	x .539	= _____
Digestive system	_____	_____	_____	x .818	= _____
Endocrine, nutritional, and metabolic	_____	_____	_____	x .979	= _____
Genitourinary system	_____	_____	_____	x .670	= _____
Infective, and parasitic	_____	_____	_____	x .951	= _____
Maternity care	_____	_____	_____	x .902	= _____
Mental disorders	_____	_____	_____	x .993	= _____
Musculoskeletal system, and connective tissue	_____	_____	_____	x .689	= _____
Neoplasms	_____	_____	_____	x .353	= _____
Nervous system and sense organs	_____	_____	_____	x .601	= _____
Respiratory system	_____	_____	_____	x .873	= _____
Skin, and subcutaneous tissue	_____	_____	_____	x .776	= _____
Symptoms, and ill-defined conditions	_____	_____	_____	x .941	= _____
Tonsillectomy	_____	_____	_____	x 1.000	= _____
Total	_____	_____	_____	x .786	= _____

1/ Total of columns (4), (8), (12), and (16), form 2, for each disease.

2/ Total of columns (4), (8), (12), and (16), form 3, for each disease.

Form 6--Aggregate hospital cases and in-patient days for: _____

Age group	(1) Utilization rate	(2) 1,000 population	(3) Cases: (1) x (2)	(4) Average stay	(5) In-patient days (3) x (4)
Male:					
Under 15	51.6	_____	_____	3.5	_____
15-44	83.9	_____	_____	5.2	_____
45-64	188.1	_____	_____	7.0	_____
65+	602.6	_____	_____	7.4	_____
Total			_____		_____
Female:					
Under 15	42.4	_____	_____	3.5	_____
15-44	204.8	_____	_____	5.3	_____
45-64	235.9	_____	_____	7.4	_____
65+	743.1	_____	_____	7.8	_____
Total			_____		_____
Total:					
Under 15			_____		_____
15-44			_____		_____
45-64			_____		_____
65+			_____		_____
Total			_____		_____

Local care cases: _____ (total cases) x 78.6 percent = _____

Local in-patient days: _____ (total days) x 78.6 percent = _____

Form 7--Calls for ambulance service for: _____

Type of call for ambulance service	Number
------------------------------------	--------

Highway accidents (obtained from highway patrol records): _____

Transfers (obtained from ambulance and hospital records): _____

Other medical calls (obtained from ambulance and hospital records): 1/ _____

Other medical calls by age group: 1/

<u>Age group</u>	<u>1,000 pop. by age group</u>	<u>Annual calls per 1,000 pop. per age group</u>	<u>Total annual calls per age group</u>
Under 20	_____	3.23	_____
20-29	_____	10.66	_____
30-39	_____	11.29	_____
40-49	_____	8.81	_____
50-59	_____	21.15	_____
60-69	_____	37.81	_____
70-79	_____	137.87	_____
Over 80	_____	216.95	_____
Total			_____
			Total calls _____

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1/ Either of these two methods may be used.

APPENDIX C

Illness Classification

<u>Illness</u>	<u>Diseases</u>
<u>Infective and parasitic diseases</u>	Salmonella food poisoning, Staphylococcal food poisoning, Viral gastroenteritis, Pulmonary tuberculosis, Streptococcal pharyngitis, Herpes zoster, Herpes simplex, Measles, Rubella, Infectious hepatitis, Mumps, Epidemic pleurodynia, Infectious mononucleosis, Viral warts, Plantar warts, Syphilis, Gonorrhea, Venereal warts, Dermatophytosis of hair and scalp, Dermatophytosis of nails and skin, Coccidioidomycosis, Vaginitis due to Trichomonas or Moniliasis, and Sarcoidosis
<u>Neoplasms</u>	Malignant neoplasm of stomach, Malignant neoplasm of colon, Malignant neoplasms of skin, Malignant melanoma of skin, Malignant neoplasm of breast, Malignant neoplasm of cervix uteri, Malignant neoplasm of corpus uteri, Malignant neoplasm of prostate, Malignant neoplasm of testis, malignant neoplasm of bladder, Malignant neoplasm of kidney, Malignant neoplasm of thyroid gland, Secondary malignant neoplasm-bone, Hodgkin's disease, Chronic lymphatic leukemia, Acute myeloid leukemia, Benign neoplasm-large intestine, Lipoma-Uterine fibroid, Neoplasm of brain
<u>Endocrine, nutritional, and metabolic diseases</u>	Simple goiter, Hyperthyroidism, Adenoma of thyroid, Hyperfunc. thyroid nodules, Hypothyroidism, Diabetes mellitus, Hyperparathyroidism, Gout, and Obesity
<u>Diseases of the blood and blood-forming organs</u>	Iron deficiency anemia and Pernicious anemia
<u>Mental disorders</u>	Senile dementia, Anxiety neurosis and Alcoholism, Psychogenic disorder, digestive system, Psychosis and neuroses, and Chronic brain syndrome

Diseases of the nervous system and sense organs

Bacterial meningitis, Multiple sclerosis, Parkinson's syndrome, Epilepsy, Idiopathic, Migraine, Trigeminal neuralgia, Schiatica, Mononeuritis, Neuropathy, Conjunctivitis, Uveitis, Refractive errors, Cataract, Glaucoma, Otitis media, Labyrinthitis, Meniere's disease, Cerumen, Conduction deafness, and Nerve deafness

Diseases of the circulatory system

Rheumatic fever, Mitral stenosis, Chronic rheumatic heart dis., Essential benign hypertension, Hypertensive heart disease, Myocardial infarction, Angina pectoris, Acute pericarditis, Subacute bact. endocarditis, congestive heart failure, Arrhythmia, Cerebrovascular accident, Cerebral arteriosclerosis, Peripheral arteriosclerosis, Aortic aneurysm, Pulmonary embolism, Thrombophlebitis, Varicose veins of legs, Hemorrhoids

Diseases of the respiratory system

Acute upper respiratory inf., Acute sinusitis, Acute bronchitis, Influenza, Viral pneumonia, Bacterial pneumonia, Chronic bronchitis, Emphysema, Asthma, Chronic sinusitis, Hay fever, Spontaneous pneumothorax, Pneumoconiosis, Bronchiectasis

Diseases of the digestive system

Gastric ulcer, Duodenal ulcer, Acute appendicitis, Inguinal hernia, Hiatal hernia, Diverticulitis of colon, Regional enteritis, Ulcerative colitis, Constipation, Anal fissure and fistula, Cirrhosis of liver, Acute cholecystitis and cholelithiasis, Acute pancreatitis, Chronic pancreatitis

Diseases of the genitourinary system

Acute glomerulonephritis, pyelonephritis, Renal calculi, Cystitis, Urethritis, Urinary tract infection, Hyperplasia of prostate, Acute prostatitis, Chronic prostatitis, Hydrocele, Epididymitis and orchitis, Chronic systic mastitis, Pelvic inflammatory disease, Cervicitis and erosion, Vaginitis, Amenorrhea, Dysmenorrhea, Menorrhagia and metrorrhagia and Menopausal symptoms

Diseases of the skin and subcutaneous tissues

Cellulitis, Lymphangitis, Pyogenic skin infections, Dermatitis seborrheic, atopic contact, Psoriasis, Pruritus ani, Pruritus vulvae, Actinic keratosis, Ingrowing toenail, Hypertrichosis, Acne vulgaris, Sebaceous cyst, Urticaria, Pigmented lesion of skin

Diseases of the musculoskeletal system and connective tissue

Rheumatoid arthritis, Osteoarthritis, Osteomyelitis, Osteitis deformans, Osteoporosis, Internal derangement of knee, Intervertebral disc hernia, Cervivcal radiculitis, Low back syndrome, Acute bursitis, Ganglion, Systemic lupus erythematosus

Congenital anomalies

Congenital heart disease

Symp. & ill-defined conditions

Vertigo, Disturbance of sleep, Epistaxis, Undue fatigue

Accidents, poisonings & violence

Fracture of proximal neck of humerus, closed, displaced, Fracture of humerus, open, displaced, Fracture of radius and ulna, closed, displaced, Fracture of radius and ulna, open, displaced, Fracture of wrist, closed, displaced, Fracture of neck of femur, Fracture of femur closed, non-displaced, Fracture of femur, open, displaced, Fracture of patella, closed, non-displaced, Fracture of patella, closed, displaced, Fracture of tibia, closed, non-displaced, Fracture of fibula, closed, non-displaced, Fracture of tibia and fibula, closed, displaced and Fracture of tibia and fibula, open, displaced, Fracture of ankle, closed, non-displaced, Fracture of ankle, closed, displaced, Subdural hematoma, Head injury, Foreign body and eye, Burn, bee sting, sun stroke, heat exhaustion, Serum hepatitis