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Health Care Delivery in Maine II: Conditions Explaining Hospital Admission

JOHN E. WENNBERG, M.D.* ALAN GITTELSON, Ph.D.** and DAVID SOULE†

The incidence of surgery has been shown to vary extensively among Hospital Service Areas in Maine,¹ a finding consistent with previous studies of patterns of use of surgery among neighboring communities.²⁻⁶ In the present study, our purpose is to examine the incidence of hospitalization and bed use according to the conditions explaining hospital admission and to consider the significance of our findings for hospital facility planning. Data are presented comparing hospitalization rates among the populations of the five Maine Comprehensive Health Planning Regions and among their constituent Hospital Service Areas (HSAs). The differences among Planning Regions in hospital use for treating patients with conditions belonging to 13 major International Classification of Disease (ICDA) groups are studied. For patients with diseases of the respiratory system, we show the specific conditions assigned as the cause of hospital admission.

Our results show little difference among Planning Regions in use of hospital for patients with congenital anomalies and for conditions associated with pregnancy. However, for illnesses of the respiratory tract, for infectious and parasitic illnesses and for ill defined conditions or symptoms, the range of differences among the Planning Regions in use of hospitals is greater than two-fold. For several common, nonsurgical illnesses of the respiratory

tract, the range in incidence rates is more than five-fold, a variability greater than that for tonsillectomy. The variety of use of hospitals for many common medical and surgical conditions indicates the importance of taking population-based data on patient mix into account in interpreting the need of communities for expansion of their bed supply.

METHODS

The methods of measuring per capita use of hospital care are presented in the first article of this series.¹ A discharge abstract for each patient admitted to any Maine hospital in 1973 provides information on diagnoses, procedures and patient characteristics, including town of residence. Utilization rates are computed for HSAs, which are groups of adjacent Maine towns around given facilities, and for the five Maine Comprehensive Health Planning Regions based on total residential use of health services, irrespective of whether care was obtained in or out of the local area or planning region. The latter include the Southern Maine, Tri-County, Kennebec Valley, Northeast, and Aroostook regions. The locations of the five Maine Comprehensive Health Planning Regions and 42 Maine Hospital Service Areas are shown in Figure 1. Appendix Table 1 lists, for each Comprehensive Health Planning Region, the populations and number of hospital beds of its constituent HSAs.

The condition causing hospitalization is entered on the discharge abstract as the "principal diagnosis" and is defined as "the condition, determined after study, that occasioned the patient's admission to the hospital."⁷ The frequencies of use by all Maine hospitals of each of 13 major ICDA groups are presented in Appendix Table 2. Diseases of

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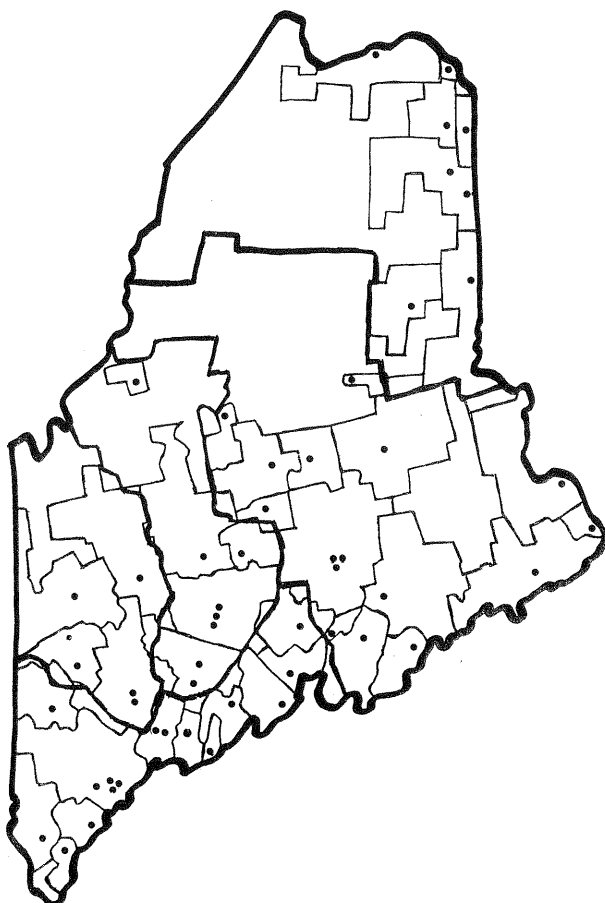


Figure 1. Showing the 5 Maine Comprehensive Health Planning Regions and the 42 Hospital Service Areas.

the respiratory system are examined in more detail in Appendix Table 3. Twelve groups of respiratory conditions are based on the acute or chronic nature of the condition, the site of the illness within the respiratory tract and diagnostic specificity. The ICDA codes within each subgroup of respiratory conditions and their frequency of use are presented below.

We measure the average daily number of beds occupied by patients per 1000 population by dividing the patient rate by 365. The patient day rate is the number of days the residents of an area spend in the hospital annually per 1000 persons at risk. Among the areas, the average number of beds occupied by the population is studied for the same groupings of ICDA codes used in the study of incidence of causes of hospitalization. The incidence and patient day rates used in the study have been age adjusted to the total Maine population to reduce the effect of population differences in age structure as a contributor to differences among areas. For the types of utilization rates studied, a number of areas are significantly higher or lower than the State average by chi square tests. Of greater interest is the extent to which areas differ which we indicate by

APPENDIX TABLE 1

POPULATION AND NUMBER OF HOSPITAL BEDS, MAINE COMPREHENSIVE HEALTH PLANNING REGIONS AND CONSTITUENT HOSPITAL SERVICE AREAS		
<i>Regions and Areas</i>	<i>1970 Population</i>	<i>Number of Beds (1973)</i>
Comprehensive Health Planning		
Regions		
Southern Maine Comprehensive		
Health Planning Region	362848	1665
Hospital Service Areas		
Bath	16578	92
Belfast	12399	58
Biddeford	47603	135
Boothbay Harbor	5156	36
Bridgton	8922	34
Brunswick ¹	30702	134
Camden	5491	33
Damariscotta	6029	42
Portland ³	170879	893
Rockland	28043	87
Sanford	20908	82
York	10138	39
Tri-County Comprehensive Health		
Planning Region	153099	690
Hospital Service Areas		
Farmington	21345	49
Lewiston ¹	95551	503
Norway	10986	41
Rumford	25217	97
Kennebec Valley Comprehensive		
Health Planning Region	149112	757
Hospital Service Areas		
Augusta-Gardiner ¹	61146	225
Jackman	1151	8
Pittsfield	11298	31
Skowhegan	23877	92
Waterville ²	51640	401
Northeast Comprehensive Health		
Planning Region	206799	945
Hospital Service Areas		
Bangor ²	104591	494
Bar Harbor	8708	67
Blue Hill	7172	24
Calais	9848	71
Castine	1080	16
Dexter	6981	19
Dover-Foxcroft	8638	32
Eastport	2867	14
Ellsworth	13043	64
Greenville	2763	24
Lincoln	11525	30
Machias	13358	38
Millinocket	11977	34
Milo	4248	18
Aroostook Comprehensive Health		
Planning Region	87201	472
Hospital Service Areas		
Caribou	12716	73
Fort Fairfield	5552	65
Fort Kent	19442	70
Houlton	15793	119
Island Falls	4399	21
Presque Isle ¹	24816	94
Van Buren	4483	30

¹HSA contains 2 hospitals

²HSA contains 3 hospitals

³HSA contains 4 hospitals

APPENDIX TABLE 2

FREQUENCY OF CONDITIONS CAUSING HOSPITALIZATION, GROUPED
MAJOR SYSTEMS OF DISEASE; ALL MAINE HOSPITALS 1973

<i>Diagnosis Group</i>	<i>ICDA-8</i>	<i>Number of Total Discharges</i>	<i>Percent of All Discharges</i>
Digestive System	520-577	20383	12.97
Respiratory System	460-519	19893	12.66
Circulatory System	390-458	19192	12.21
Pregnancy, Delivery, and Puerperium	630-678	17932	11.07
Genitourinary System	580-629	15913	10.13
Accidents, Injuries, and Violence	800-999	15689	9.98
Nervous	290-389	11698	7.44
Neoplasm	140-239	10275	6.54
Skin and Subcutaneous Tissue	680-738	8986	5.72
Symptoms and Ill-Defined Conditions	780-796	7213	4.59
Endocrine, Nutritional, and Metabolic	240-289	4327	2.75
Infective and Parasitic	000-136	4294	2.73
Congenital Abnormalities	740-779	1838	1.17
All Conditions	000-999	157085	100.00

the coefficient of variation. It is obtained by dividing the standard deviation of the rates over areas by the mean and expressing the ratio as a percent. The coefficient provides an index of variability in the observed rates. The range between highest and lowest rates also is used as a measure of variability.

RESULTS

Variations in Incidence of Hospitalization Among and Within Planning Regions. Substantial differences exist in the incidence of hospitalization among the Planning Regions (Table 1). In the Aroostook and Kennebec regions, discharged are 23% and 21% higher than the State average while the Southern Maine, Northeast and Tri-County regions have rates lower than the State average by 8%, 7%, and 3% respectively. Comparing the highest and the lowest Comprehensive Health Planning Regions, 35% more discharges per capita occurred in the Aroostook Planning Region in 1973 than in the Southern Maine Planning Region. For the Hospital Service Areas within the five Planning Regions, the rates of hospitalization show greater variation than between the Planning Regions themselves (Table 1). The smallest range of difference is 1.43 fold in the Tri-County region; the largest is 1.96 fold in the Northeast Planning Region. While the coefficient of variation among Planning Regions is 15.6%, the intra-regional coefficients range from 15% to 22%.

The results indicate that differences in hospitalization practices within the HSAs of a Planning Region are greater than those among the regions themselves. Population size for the area and differences among HSAs in rate of use of hospitals located outside of Maine may contribute to greater variation among HSAs than among the larger regions, but we believe these effects are not the major reason for the observed differences. The effect of small population size has been reduced by excluding

areas with less than 4,000 residents from the analysis. Based on State average rates, the expected number of cases in the smallest HSA is 775. None of the lowest ranked HSAs are located on the New Hampshire border.

Incidence of Hospitalization by Major ICDA Group. The variability in use of hospitals is not similar for all conditions (Table 2). The greatest variability is among persons admitted for conditions related to the respiratory tract, for infective and parasitic diseases and for ill-defined conditions where the rates among Planning Regions show over a two-fold range of differences. By contrast, admissions for conditions associated with pregnancy and for congenital anomalies show the least variability; the highest rate is only 25% and 18% greater than the lowest, respectively. It is of note that conditions that vary least are defined by specific, well agreed upon criteria.

Incidence of Hospitalization for Specific Respiratory Conditions. Age-adjusted rates of use of hospitals for the major ICDA group of respiratory diseases show greater than a two-fold range of difference among Planning Regions. Specificity concerning the patient mix which contribute to these differences in rates is obtained by examining use of each individual ICDA code (Appendix Table 3). About 45% of respiratory admissions are for acute infections of the respiratory tract, 32% for hypertrophy of the tonsil, and 11% for chronic lung conditions. A group of less common conditions make up the remaining 12% of cases. Table 3 shows how the Planning Regions differ with respect to use of hospitals for acute and chronic respiratory tract conditions and for tonsillectomy. For hypertrophy of the tonsils, the Kennebec region exceeds the lowest area by 207%. For acute infections, the highest region is Aroostook which exceeds Kennebec by 32% and Southern Maine by 268%. Upper respiratory infections contribute most to the dif-

APPENDIX TABLE 3

FREQUENCY OF USE OF INTERNATIONAL CLASSIFICATION DISEASE CODES FOR RESPIRATORY DISEASE MAINE HOSPITALS, 1973			
<i>ICDA Number</i>	<i>Number of Cases</i>	<i>Percent of All Respiratory Cases</i>	<i>Disease Label</i>
460	103	0.50	Common Cold
461	46	0.22	Acute Sinusitis
462	362	1.75	Acute Pharyngitis
463	383	1.85	Acute Tonsillitis
464	409	1.98	Acute Laryngitis
465	878	4.25	Acute Respiratory Infection, Unspecified
466	1,835	8.89	Acute Bronchitis
470	635	3.07	Influenza, Unqualified
471	45	0.22	Influenza with Pneumonia
472	145	0.70	Influenza, Other Respiratory Cold
473	45	0.22	Influenza with Digestive Manifestations
474	4	0.02	Influenza with Nervous Manifestations
480	215	1.04	Viral Pneumonia
481	334	1.62	Pneumococcal Pneumonia
482	97	0.47	Other Bacterial Pneumonia
483	39	0.19	Pneumonia from Other Specified Organism
484	28	0.14	Interstitial Pneumonia
485	947	4.59	Bronchopneumonia
486	2,178	10.55	Unspecified Pneumonia
490	652	3.16	Bronchitis, Unqualified
491	424	2.05	Chronic Bronchitis
492	1,144	5.54	Emphysema
492	764	3.70	Asthma
493	6,570	31.81	Hypertrophy of Tonsils
501	67	0.32	Peritonsillar Abscess
502	17	0.08	Chronic Pharyngitis
503	185	0.90	Chronic Sinusitis
504	496	2.40	Deviated Nasal Septum
505	132	0.64	Nasal Polyp
506	65	0.31	Chronic Laryngitis
507	21	0.10	Hay Fever
508	344	1.67	Other Disease of Upper Respiratory Tract
510	32	0.15	Empyema
511	127	0.61	Pleurisy
512	142	0.69	Spontaneous Pneumothorax
513	19	0.09	Lung Abscess
514	77	0.37	Pulmonary Congestion
515	4	0.02	Pneumoconiosis
516	1	—	Other Pneumoconiosis
517	83	0.40	Chronic Interstitial Pneumonia
518	69	0.33	Bronchiectasis
519	487	2.36	Other Diseases of Respiratory System
450-519	20,650		

TABLE 1

AGE-ADJUSTED DISCHARGES FROM HOSPITAL PER 1000 POPULATION, MAINE COMPREHENSIVE HEALTH PLANNING REGIONS AND CONSTITUENT HOSPITAL SERVICE AREAS (1973)					
	<i>Southern Maine</i>	<i>Tri-County</i>	<i>Kennebec</i>	<i>Northeast</i>	<i>Aroostook</i>
Region as a Whole	150	157	197	152	204
Hospital Service Areas Ranked within Regions:					
Highest	212	192	235	249	309
2nd Highest	193	158	234	230	283
2nd Lowest	127	153	204	146	185
Lowest	117	134	157	127	172
Ratio of highest to lowest ranked Hospital Service Areas	1.81	1.43	1.50	1.96	1.80
Coefficient of variation*	18%	15%	18%	21%	22%

*The coefficient of variation includes all HSAs within a planning region except those with populations less than 4,000.

TABLE 2

AGE-ADJUSTED DISCHARGE RATE BY CONDITIONS CAUSING HOSPITALIZATION IN FIVE MAINE COMPREHENSIVE HEALTH PLANNING REGIONS. RATES PER 10,000 POPULATION, 1973							
Condition*	Southern Maine	Tri-County	Kennebec	Northeast	Aroostook	Ratio of highest to lowest	Coefficient of Variation
Infective and Parasitic	31	49	64	40	75	2.42	34.6
Neoplasm	112	114	116	88	106	1.32	10.3
Endocrine	41	50	61	35	50	1.74	21.3
Nervous	116	108	131	101	143	1.42	14.3
Circulatory	181	191	228	187	296	1.64	22.1
Respiratory	151	183	300	199	340	2.25	34.5
Digestive	190	202	256	206	271	1.43	16.0
Genitourinary	182	155	159	145	182	1.26	10.4
Delivery	191	193	197	182	158	1.25	8.7
Skin and Subcutaneous Tissue	81	82	122	92	126	1.56	22.2
Congenital	19	17	20	20	20	1.18	6.3
Ill-defined	58	80	117	67	86	2.02	28.0
Injuries	150	151	204	158	188	1.36	14.1
All Conditions	1504	1573	1975	1520	2035	1.35	15.2

*ICDA codes for each group are shown in Appendix Table 2.

TABLE 3

CONDITIONS CAUSING HOSPITALIZATION OF RESIDENTS WITH RESPIRATORY ILLNESS IN FIVE MAINE COMPREHENSIVE HEALTH PLANNING REGIONS, 1973									
Condition	ICDA Code	Percent of All Respiratory Cases	Rates per 10,000 Population Southern Maine Rate	Tri-County Rate	Kennebec Rate	Northeast Rate	Aroostook Rate	Ratio of Highest to Lowest	Coefficient of Variation
Acute Upper Respiratory Tract Condition and the Common Cold	460,465	4.8	5.2	6.1	15.0	6.7	29.7	5.71	82.7
Acute Sinusitis, Pharyngitis, Tonsillitis, Laryngitis	461-464	5.8	7.1	9.5	15.1	9.5	30.1	4.23	65.4
Acute Bronchitis	466	8.9	16.0	12.3	39.0	12.4	29.1	3.17	54.4
Influenza with or without Complication	470-474	4.2	3.8	5.8	12.7	9.0	26.2	6.89	77.2
Pneumonia, Viral or Bacterial or Interstitial	480-484	3.5	11.3	4.4	8.6	8.7	8.7	2.57	29.7
Bronchopneumonia, unspecified	485	4.6	6.4	8.8	8.9	10.2	16.3	2.55	36.7
Pneumonia unspecified, or Bronchitis, unqualified	486,490	13.7	20.9	31.1	33.0	32.6	33.8	1.62	17.6
Chronic Bronchitis, Emphysema	491-492	7.6	14.9	15.9	18.4	13.9	19.9	1.43	15.0
Asthma	493	3.7	6.7	4.8	9.1	7.2	12.1	2.52	34.7
Hypertrophy of Tonsils	500	31.8	49.8	64.4	103.0	66.0	80.7	2.07	27.7
Deflected Nasal Septum	504	2.4	6.4	3.1	5.1	2.9	9.4	3.24	49.7
All Others	501-504								
	506-519	9.1	15.0	17.2	28.7	17.1	23.6	1.91	28.0

ferences in use of hospitals. Influenza admissions are nearly 7 times more common; acute upper respiratory conditions are 5.7% and acute infections of the naso-pharynx are 4.2 times more common in Aroostook Planning Region than in the Southern Maine Planning Region. For pneumonia and bronchitis, hospitalizations are 1.6 to 2.5 times more common in Aroostook Planning Region except for pneumonias in which the etiologic agent or syndrome has been identified.

Use of Hospital Beds. We have measured the differences in use of hospital beds associated with variations in patient mix treated in Maine hospitals. Table 4 shows the average number of beds occupied

per 1000 population in each of the five Planning Regions and in the high and low bed use HSAs within Planning Regions. Among the Planning Regions, the population in the region of highest utilization used 35% more beds than the population of the lowest region. Within Planning Regions, differences among HSAs in use of hospital beds is considerably greater. The greatest differences are within the Northeast region where the range in bed use patterns is from 2.4 to 4.6 beds per 1000, a 1.9 fold difference.

The variability in use of beds is not the same for each major diagnostic grouping, and the degree of variability follows closely with differences among

TABLE 4

AVERAGE NUMBER OF BEDS OCCUPIED PER 1000 POPULATION. AGE-ADJUSTED RATES FOR FIVE MAINE COMPREHENSIVE HEALTH PLANNING REGIONS AND CONSTITUENT HOSPITAL SERVICE AREAS (1973)					
	<i>Southern Maine</i>	<i>Tri-County</i>	<i>Kennebec</i>	<i>Northeast</i>	<i>Aroostook</i>
Region as a Whole	2.9	3.3	3.7	2.8	3.9
<i>Hospital Service Areas Ranked within Regions:</i>					
Highest	3.6	3.6	4.6	4.6	5.5
2nd Highest	3.5	3.4	4.3	4.0	4.9
2nd Lowest	2.1	2.9	4.0	2.6	3.4
Lowest	2.0	2.3	2.8	2.4	3.4
Ratio of highest to lowest ranked Hospital					
Service Areas	1.80	1.57	1.64	1.92	1.62
Coefficient of Variation*	20%	19%	20%	21%	20%

*The coefficient of variation includes all HSAs within a planning region except those with populations less than 4,000.

the areas in the incidence of hospitalization. (Table 5). The pattern of bed use among the regions are quite similar for conditions which have similar rates of hospitalization. For congenital anomalies, and deliveries, bed-use ranges from 2.0 to 2.4 beds per 10,000 population, a 1.2 fold difference. On the other hand, for conditions with greater variability in incidence, respiratory, infective and parasitic diseases and the class of conditions labeled as "ill defined and symptoms," bed-use ranges from 3.6 beds per 10,000 in Southern Maine region to 7.8 beds per 10,000 in the Aroostook region, a 2.17 fold difference. The conditions with intermediate variability in incidence have intermediate variability in bed use. Again, to ascertain the specific reasons for differences among the regions, it is necessary to look more precisely at the conditions causing admission (Table 6). For example, in 1973, on an age-adjusted basis, for persons living in the Aroostook region, 1.4 beds per 10,000 were used for acute upper respiratory disease (excluding hypertrophy of the tonsils) and the flu; for persons living in Southern Maine, only 0.2 beds per 10,000 were used to treat these conditions. This represents a 7.7 fold difference in allocation of hospital facilities for these conditions.

DISCUSSION

While variations in incidence of common surgical procedures have been documented among regions and HSAs in Maine, Vermont and Kansas, we are aware of no previous report of use of hospitals in such areas according to the reasons for which the patients are admitted to the hospital. Our results indicate the importance of taking into account the case mix admitted to hospital on a per capita basis among neighboring areas in evaluating the uses made of hospitals. The overall incidence of hospitalization varies as much as 35% among the Plan-

ning Regions; however, certain classes of diseases contribute substantially more to the differences than do others. Admissions associated with pregnancy, and congenital anomalies, show the least differences among areas; infective and parasitic diseases, ill defined conditions and symptoms and respiratory diseases show the greatest. Medical as well as surgical conditions contribute to variation in hospitalization.

Studies in Vermont have shown that the volume of surgical procedures relate to differences in the specialty of active physicians and in the quantity of beds available in an area and not to differences in illness rates or access to physicians.⁸ Systematic studies of the relationship between health care system variables, the incidence of illness and rates of hospitalization for specific conditions causing admission are not available. Circumstantial evidence, however, suggest the differences relate to supply characteristics. In this study, the possible contribution of age-structure differences have been removed by age adjustment. It seems unlikely that the natural incidence of influenza, upper respiratory tract infections and hypertrophy of the tonsils will vary so as to account for the greater than five-fold differences we observed in rates of hospitalization for these conditions. Further, among the different, neighboring HSAs within a Planning Region — where differences among the populations-at-risk would seem less than when comparisons are based on Planning Regions — the use of hospitals varies more than between Planning Regions. The reason for this, we suggest, is because within a given HSA, usually one and at the most four hospitals are the principal institution involved, and there is thus a close correspondence between the medical community of an area and local rates of service. Within these areas, a relatively small cohort of physicians are the dominant

TABLE 5

AGE-ADJUSTED AVERAGE NUMBER OF BEDS OCCUPIED PER 100,000 POPULATION IN MAINE COMPREHENSIVE HEALTH PLANNING REGIONS BY CONDITION CAUSING ADMISSION							
<i>Condition Ranked by Variability of Incidence Rates</i>							
<i>Condition</i>	<i>Southern Maine</i>	<i>Tri- County</i>	<i>Kennebec</i>	<i>Northeast</i>	<i>Aroostook</i>	<i>Ratio of Highest to Lowest</i>	<i>Coefficient of Variation</i>
Congenital	3.6	3.8	3.9	3.5	4.0	1.14	5.5
Delivery	19.9	18.1	19.6	18.3	15.9	1.25	8.6
Genitourinary	25.0	26.8	26.6	23.5	30.3	1.29	9.6
Nervous	20.4	22.2	24.4	17.9	22.0	1.36	11.3
Neoplasms	29.5	35.7	33.1	26.3	29.9	1.36	11.7
Digestive	38.2	46.7	48.0	40.6	52.5	1.37	12.8
Injuries	33.0	33.1	42.7	30.1	38.1	1.42	14.1
Circulatory	55.2	61.6	66.3	50.8	79.1	1.56	17.5
Skin and Subcutaneous Tissue	17.7	17.8	26.6	19.8	24.3	1.50	18.9
Endocrine	9.4	12.7	12.6	7.9	11.3	1.61	19.4
Ill-Defined	8.5	13.2	17.9	9.3	11.8	2.12	30.7
Infective and Parasitic	5.1	8.0	9.3	6.4	12.9	2.53	36.0
Respiratory	22.0	26.7	40.5	27.9	53.0	2.41	37.1

TABLE 6

AGE-ADJUSTED AVERAGE NUMBER OF BEDS OCCUPIED PER 100,000 POPULATION OF MAINE COMPREHENSIVE HEALTH PLANNING REGIONS BY RESPIRATORY CONDITION CAUSING ADMISSION							
<i>Condition Ranked by Variability of Incidence Rates</i>							
<i>Condition</i>	<i>Southern Maine</i>	<i>Tri- County</i>	<i>Kennebec</i>	<i>Northeast</i>	<i>Aroostook</i>	<i>Ratio of Highest to Lowest</i>	
Acute Upper Respiratory Tract Infection and Influenza	1.8	2.7	5.5	3.1	14.0	7.8	
Acute Bronchitis and Pneumonias	9.3	11.1	17.6	12.3	19.6	2.1	
Asthma, Chronic Bronchitis and Emphysema	5.0	5.0	6.4	5.2	7.7	1.5	
Hypertrophy of Tonsils	2.9	3.6	6.2	3.8	5.3	2.1	
All others	3.0	4.3	4.9	3.7	5.8	1.9	

suppliers of medical services and local strategies for allocating hospitalized health care reflect in population-based rate profiles. Individual differences among physicians and facilities are more apparent under this geographic configuration than when HSAs are aggregated into larger Planning Regions.

Our observations on the variability in use of hospitals among neighboring areas have implications for facility planning. Under new Federal legislation, the states are required to establish programs to certify the need for facility construction, renovation and other changes in service in building programs that exceed \$100,000. Hospitals which do not comply with this requirement prior to undertaking construction face a cutoff of their eligibility to receive reimbursements under the Medicaid and Medicare programs. The model of "need" which planners commonly use in assessing building projects is based on the assumption that need for institutionalization is dependent largely on the natural incidence of illness. The planning issue is often interpreted as an assurance that beds are available for the next occasion when need arises, a perception that leads to a particular emphasis on improving the

efficiency of hospital operations as measured by length of stay and average daily census (percent of occupancy).

Our epidemiologic study of the incidence of hospitalization shows the importance of taking the surgical and medical patient mix into account in evaluating the need for facilities. While the relatively low variability in use of facilities for congenital anomalies, pregnancy associated conditions and neoplasms supports the belief that demand for hospitalization may be closely related to the natural incidence of the condition — and therefore accurately predicted by a model of hospital demand based on random incidence of medical conditions — hospitalization for these events represents only 18% of hospital use in Maine. The remaining causes of admission show considerably greater variability which cannot be accounted for by a demand model which postulates approximately similar rates of incidence among the regions and HSAs and consensus among the medical profession on need for hospitalization.

CONCLUSIONS

For many illnesses, the need for hospital beds

depends on physician choice of place and type of treatment. Those choices are made differently among Planning Regions and Hospital Service Areas in Maine with resultant differences in per capita use of hospital beds. Planners who seek to certify the need for hospital facilities should take into account differences in the mix of hospitalized patients. Because questions raised about the need for additional procedures and admissions for specific conditions concern the effectiveness of alternative placements and treatments, answers depend on the status of ambulatory, nursing home as well as hospital resources and these factors need to be taken into account. Since questions about effectiveness are most commonly addressed to members of the medical profession, the review process established to certify the need for facilities should, presumably, involve a panel of physicians to advise on the medical necessity of different levels of use of hospitalized care.

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