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## HOSPITAL UTILIZATION AND AVERAGE DAILY HOSPITAL COSTS FOR PERSONS AGED 65 AND OVER AS INDICATED BY DATA UNDER THE HOSPITAL INSURANCE PROGRAM AND FROM THE AMERICAN HOSPITAL ASSOCIATION

by  
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An analysis of the first 3 years of experience under the HI program, based on 100% of the individual provider bills processed through December 30, 1969 has just been completed. The analysis of the inpatient hospital utilization rates has been made on an incurred basis (i.e., according to the time when the services were rendered), rather than on the basis of when the benefits were paid or when the bills were recorded.

The available data, particularly for the later months of the period, are somewhat understated because not all bills for the period have been submitted and processed. Adjustment is made for this factor, as will be indicated subsequently.

It is of interest not only to analyze the HI utilization data, but also to compare such data with certain parallel information obtained by the American Hospital Association for persons aged 65 and over from a sample of hospitals. The AHA data relate to non-Federal, short-term, general and special hospitals. Specifically, for each month, it is possible to obtain from the AHA data the estimated number of patient days in this category of hospitals which relate to persons aged 65 and over. By adjusting the number of patient days to take into account the length of the particular month and by relating the adjusted figure to the total population aged 65 and over, an annual utilization rate per capita can be derived.

In theory, the utilization figures derived from the AHA data should closely parallel the experience under the HI program. There is an overstatement in the data derived from

the AHA material, because of the inclusion of all days in long-duration cases (some of which are not covered by HI). There is an understatement, because data for long-stay hospitals (hospitals with average length of stay greater than 30 days, such as tuberculosis, psychiatric, and chronic disease hospitals) are not included in the AHA survey (such days representing about 4½% of the total days in the HI experience).

Analysis has also been made as to average daily hospital costs according to the HI experience and according to AHA data that relate to persons of all ages. Once again, the AHA data came from a monthly sample survey. There is a significant difference between the HI and AHA figures. The former relate to the average daily inpatient cost per patient day (based on interim payments by the program and on cost-sharing payments made by the beneficiaries, but not taking into account any final adjustments between the interim payments and the audited cost reports). On the other hand, the latter relate all hospital expenditures (including the cost of operating outpatient departments, restaurants open to the public, gift shops, research, nursing schools, etc. without offsetting any income therefrom) to total inpatient days.

There is also some lack of comparability, because of the different types of hospitals included in the two sets of data. In balance, the AHA average daily costs should significantly exceed the HI ones. There may, however, be some significance attached to the relative secular trends of these two series considered separately.

Table 1 compares the inpatient hospital utilization rates for persons aged 65 and over according to these two sets of data for several different time periods. The HI data have been adjusted to reflect the estimated lack of completeness of the data for the later periods (see footnote b of Table 1). In considering both sets of data, it should be kept in mind that an influenza epidemic significantly affected the utilization rate for the last 6 months of 1968 and the first 6 months of 1969.

The HI data show a slowly rising trend with time, the annual rate of increase in the utilization rate being about 3-4%. On the other hand, the AHA data show a much more rapid rate of increase. The utilization rates from the AHA data begin at a significantly lower level than the HI data and approach the latter rates at the end of the period. The AHA data show annual rates of increase in the utilization rate amounting to at least 7% for periods up through the middle of 1968.

The differential of approximately 2% between the AHA utilization rate and the HI utilization rate for the later periods seems reasonable in view of the slightly different content of these two sets of data. There is no apparent explanation for the relatively low level of the AHA utilization rates in the early periods, particularly in July-December 1966. In fact, one is led to believe that there is some basic fault in these data, since the HI data are on a 100% basis and, therefore cannot involve any sampling errors or fluctuations.

The AHA data have one advantage over the HI data—namely, that they possess somewhat more currency, so that more recent information is available. Specifically, the HI data for 1969 are incomplete so that accurate trend indications are difficult to obtain. The AHA data indicate that, for 1969, the inpatient hospital utilization rate for persons aged 65 and over was 1.5% higher than for 1968.

Now, turning to average daily hospital costs, Table 2 presents data for the AHA index as compared with figures derived from the experience under the HI program. The latter data are not as greatly affected by the lag in the reporting and recording of provider

bills as is the case for hospital utilization rates. In general, the bills submitted at later periods tend to reduce slightly the average daily cost.

The average daily costs under the HI program are about 25-30% lower than the corresponding figures according to the AHA index, since—as explained previously—these two concepts are significantly different. The annual rates of increase for the HI data are about 15% for all periods, while for the AHA data they tend to be slightly lower. This may result in part from the interim reimbursements being relatively low as compared to actual costs in the early periods, as contrasted with the situation in later periods (some evidence of this trend has been observed).

In passing, it may be noted that the actuarial cost estimates for the HI program contained in the 1970 Trustees Report assume increases in average daily hospital costs of 15% from 1968 to 1969, and 14% from 1969 to 1970.

The average daily hospital cost under the HI program is used as the basis for determining changes in the inpatient hospital deductible for calendar years after 1968 (and correspondingly, in the several daily cost-sharing or coinsurance provisions). Such average daily cost used in these determinations is based only on the experience for insured persons, whereas the figures given in Table 2 relate to total persons eligible under the program; this difference, however, produces only small variations in the average daily cost.

Table 3 shows the increases in average daily cost for calendar years 1967, 1968, and 1969 as measured against such cost in the last half of calendar year 1966. These figures are indicative of the increases in the inpatient hospital deductible under the HI program, which was \$40.00 in the period July 1966 through December 1968. The figure for calendar year 1969 that was promulgated (\$44.00) would have been derived regardless of whether the HI data (which were actually used) or the data from the AHA index had been utilized, because of the pro-

vision for rounding to the nearest \$4.00. In other words, using the AHA data, an increase of 10.7% applied to \$40.00 produces a figure of \$44.28, which is rounded to \$44.00. In promulgating the deductible applicable to calendar year 1970, use of the HI data produces a rounded figure of \$52.00, whereas the AHA data would have produced a figure which would have been rounded down to \$48.00.

As in the case of hospital utilization data, the AHA index of average hospital expense

per patient day has the advantage over the HI data of being more up to date in an accurate manner. The latest cost trends are indicated by the fact that the increase shown by the AHA data for the last 6 months of 1969 over the corresponding period of 1968 is 15.8%. This is somewhat *higher* than the increases in the average daily cost for similar previous periods, so that no declining trend in the rate of increase in hospital costs is as yet apparent. If the HI data show similar trends, the HI deductible for 1971 will be \$60.00.

Table 1  
COMPARISON OF INPATIENT HOSPITAL UTILIZATION  
RATES FOR PERSONS AGED 65 AND OVER

<u>Period</u>	<u>AHA Data</u>	<u>HI Data</u>	<u>Ratio AHA to HI</u>
Hospital Utilization Rate <sup>a</sup>			
2nd Half, 1966	3.25	3.72 <sup>b</sup>	.87
1st Half, 1967	3.63	3.89 <sup>b</sup>	.93
2nd Half, 1967	3.57	3.79 <sup>b</sup>	.94
1st Half, 1968	3.92	4.12 <sup>b</sup>	.95
2nd Half, 1968	3.83	3.92 <sup>b</sup>	.98
1st Half, 1969	4.04	4.14 <sup>b</sup>	.98
2nd Half, 1969	3.84	n.a.	*
Calendar Year 1967	3.60	3.84 <sup>b</sup>	.94
Calendar Year 1968	3.88	4.02 <sup>b</sup>	.97
Calendar Year 1969	3.94	n.a.	*
Fiscal Year 1967	3.44	3.80 <sup>b</sup>	.91
Fiscal Year 1968	3.75	3.95 <sup>b</sup>	.95
Fiscal Year 1969	3.93	4.02 <sup>b</sup>	.98
Increase Over Corresponding Period of Previous Year			
2nd Half, 1967	9.8%	1.9%	*
1st Half, 1968	8.0	5.9	*
2nd Half, 1968	7.3	3.4	*
1st Half, 1969	3.1	.5	*
2nd Half, 1969	.3	n.a.	*
Calendar Year 1968	7.8	4.7	*
Calendar Year 1969	1.5	n.a.	*
Fiscal Year 1968	9.0	3.9	*
Fiscal Year 1969	4.8	1.8	*

\* Not computed.

<sup>a</sup> Days per person per year.

<sup>b</sup> Actual experience based on provider bills processed through December 30, 1969, adjusted upward by ½% for 1967, 2% for 1968, and 6% for January-June 1969 allow for bills to be processed subsequently.

**Table 2**  
**COMPARISON OF AVERAGE DAILY HOSPITAL COSTS**

<u>Period</u>	<u>AHA Index<sup>a</sup></u>	<u>HI Data<sup>b</sup></u>	<u>Ratio HI to AHA</u>
		Average Daily Cost	
2nd Half, 1966	\$52.44	\$37.27	.71
1st Half, 1967	54.84	41.03	.75
2nd Half, 1967	61.34	43.53	.71
1st Half, 1968	62.04	46.96	.76
2nd Half, 1968	68.51	50.30	.73
1st Half, 1969	71.69	53.75 <sup>c</sup>	.75
2nd Half, 1969	79.35	n.a.	*
Calendar Year 1967	58.06	42.28	.73
Calendar Year 1968	65.24	48.59	.74
Calendar Year 1969	75.45	n.a.	—
Fiscal Year 1967	53.67	39.18	.73
Fiscal Year 1968	61.70	45.31	.73
Fiscal Year 1969	70.13	52.04 <sup>c</sup>	.74
		Increase Over Corresponding Period of Previous Year	
2nd Half, 1967	17.0%	16.8%	*
1st Half, 1968	13.1	14.5	*
2nd Half, 1968	11.7	15.6	*
1st Half, 1969	15.6	14.5	*
2nd Half, 1969	15.8	n.a.	*
Calendar Year 1968	12.4	14.9	*
Calendar Year 1969	15.6	n.a.	*
Fiscal Year 1968	15.0	15.6	*
Fiscal Year 1969	13.7	14.9	*

\* Not computed.

<sup>a</sup> Average hospital expense per patient day.

<sup>b</sup> Based on interim reimbursement rates to hospitals. The final audited costs seem to be about 5% higher than the interim rates for the early periods (the situation in the later periods is not known).

<sup>c</sup> Actual experience based on provider bills processed through December 30, 1969; when data for this year are complete, this figure will probably be slightly lower.

**Table 3**  
**AVERAGE DAILY HOSPITAL COST FOR VARIOUS CALENDAR YEARS  
AS PERCENTAGE OF AVERAGE FOR LAST HALF OF 1966**

<u>Calendar Year</u>	<u>AHA Index<sup>a</sup></u>	<u>HI Data<sup>b</sup></u>
1967	110.7%	113.4%
1968	124.4	130.4
1969	143.9	n.a.

<sup>a</sup> Average hospital expense per patient day.

<sup>b</sup> Based on interim reimbursement rates to hospitals. The final audited costs seem to be about 5% higher than the interim rates for the early periods (the situation in the later periods is not known).