Volume Title: Explorations in Economic Research, Volume 3, number 3

Volume Author/Editor: NBER

Volume Publisher: NBER

Volume URL: http://www.nber.org/books/sarg76-1

Publication Date: 1976

Chapter Title: The Earnings of Allied Health Personnel - Are Health Workers Underpaid?

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Chapter URL: http://www.nber.org/chapters/c9085

Chapter pages in book: (p. 408 - 432)

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The Earnings of Allied Health Personnel—Are Health Workers Underpaid?

ABSTRACT: Earnings and changes in earnings of allied health personnel (defined as wage and salary workers with less than eighteen years of schooling) are measured on the basis of the 1:100 public use samples of the 1960 and 1970 Censuses of Population. Comparisons with all nonfarm workers standardized for color, sex, age, and schooling reveal that earnings in health were 95 percent of the all-industry norm in 1969, up sharply from 86 percent in 1959. For females, who account for 80 percent of the labor hours of allied health workers, 1969 wages were equal to those in other industries. The increases in relative wages for health workers in the 1960s were much greater in hospitals than in other health settings, and were particularly rapid for registered nurses and practical nurses. Regional differentials in hospital wages are highly correlated with wage differentials for all nonfarm workers, but during the 1960s the wage gains in hospitals in the East outpaced those in the rest of the nation.

INTRODUCTION

For many decades the "underpaid" health worker was a commonplace figure in most discussions of the health industry. Not the physicians, of

course, but other health workers, such as nurses, technicians, and clerical and service employees, were said to be poorly paid relative to similar workers in other industries. With few exceptions the allegations about relative wage levels were rarely supported by systematic theoretical or empirical analysis.[1] Given the paucity of data about earnings in health, this was not surprising. Nor was it surprising that initial attention focused primarily on the earnings of physicians, who were allegedly in a dominant monopoly position.[2]

Several recent developments suggest the desirability of a closer examination of the wages of allied health personnel. First, there is the sheer size of the industry. Employment in health, excluding physicians, dentists, and other highly trained professionals, now amounts to over four million workers, approximately two-thirds of whom are employed in hospitals. Second, there is the problem of the rapid escalation of hospital costs, which have been growing by more than 10 percent per annum for the past decade. Hospitals, like other service industries, are highly labor-intensive, with payrolls accounting for about 60 percent of total expenses. Finally, note should be taken of increasing union activity in hospitals, as well as of the tendency by professional associations to press vigorously for higher wages.

There is a clear need for a firm statistical base describing wage levels and rates of change in wages for various types of manpower in hospitals and other health settings—and for analytical studies designed to explain the causes and consequences of wage variation in the health industry. This paper is intended to fill the first need and provide data toward the second. The rich detail provided by the public use samples of the 1960 and 1970 Censuses of Population makes it possible to calculate hourly earnings rates for all allied health personnel classified by occupation, sex, schooling, geographical location, and many other characteristics. Furthermore, these earnings can also be compared with those of workers with similar characteristics in other nonfarm industries. Studies coming in the wake of this descriptive paper will attempt to explain cross-sectional variations in earnings levels and rates of change and analyze the industry's response to these variations.

The following section describes the data and methods used in this paper. Next come sections reporting the results for 1969 and the changes from 1959 to 1969, a section that concentrates on regional differentials, and, finally, a brief one on changes over other time periods. Some of the questions that will be discussed are: How do wages in health compare with wages in other industries? Did wages rise more rapidly in health than in other industries in the 1960s? Was this a "catching up"? How do wage levels and rates of change vary among different health occupations and settings? How do they vary by region?

DATA AND METHODS

This study covers all wage and salary workers with less than eighteen years of schooling employed in the census week, 1970 (or 1960). who had earnings in 1969 (or 1959). Wage and salary workers with eighteen or more years of schooling and all self-employed workers are excluded in order to concentrate on the so-called allied health personnel. Data for the health industry are obtained from the 1/100 samples of the censuses, which yielded 34,489 observations in 1970 and 19,288 in 1960. Data for all nonfarm industries come from the 1/1000 samples, with 61,584 and 50,349 observations, respectively.

Workers are initially classified by sex, color (white and nonwhite), age (14–19, 20–24, 25–34, 35–44, 45–54, 55–64, and 65+), and years of schooling (≦8, 9–11, 12, 13–15, 16, 17). Average hourly earnings for each sex-color-age-schooling cell are calculated by dividing reported total annual earnings in 1969 by the estimated total annual hours worked in 1969. Annual hours for each worker are estimated by multiplying the number of weeks worked in 1969 by the number of hours worked in the census reference week in 1970. It is important to estimate hours for each worker individually and then sum across all workers in a cell (rather than multiplying the means of weeks worked and hours per week) because there is a positive correlation between weeks per year and hours per week across workers.

With this approach workers can be grouped by industry. occupation, region. or other variables, and their hourly earnings can be compared to the national norm (defined as all nonfarm industries) in the following way: an "expected" hourly earnings for each industry. occupation. et cetera is calculated by multiplying the hourly earnings rate for all nonfarm industries in each sex-color-age-schooling cell by the total annual hours worked in each cell in the particular industry, occupation. et cetera. and dividing by the total annual hours for all cells. That is.

Expected hourly earnings = $\Sigma_c W_c H_{ci} \div \Sigma_c H_{ci}$

where W_c = average hourly earnings in U.S. nonfarm industries of wage and salary workers in ceil c and H_{ci} = total hours worked in industry or occupation i by workers in cell c. The ratio of actual to expected earnings provides a wage index for i standardized for sex, color, age. and schooling.

While these data and methods provide a richer picture of the earnings of allied health manpower than is available from any other source. some shortcomings and possible biases should be noted. First. the method of estimating annual hours, using the weeks worked in 1969 (or 1959) and the hours worked in the census week in 1970 (or 1960). is appropriate only if the hours worked in the census week are a good approximation of

average weekly hours in the preceding year. For individual workers this will frequently not be the case, but for large groups of workers individual differences tend to cancel out.[3] As a general rule of thumb, little confidence should be placed in estimates based on fewer than 50 workers, and no such estimates are presented. Indeed, any estimates based on fewer than 100 workers will be clearly identified.

Second, the average earnings figure calculated is not a simple average of the hourly earnings of each worker but a weighted average where the weights are the annual hours of each worker. I believe the weighted average to be preferable for most purposes. It tells us, for instance, what the average wage paid for an hour of nurses' services was rather than reporting the wage rate of the average nurse. The former is likely to be estimated with greater accuracy because the hourly earnings of workers with very low annual hours are probably estimated with considerable error. There are some applications, however, such as estimation of supply functions, where the unweighted average might be preferable.

Another problem concerns the omission of fringe benefits from the earnings estimates. The ratio of fringes to direct wages may vary from occupation to occupation, or from region to region. To the extent that it does, the hourly earnings data are an imperfect estimate of labor costs to the employer or labor compensation to the employee.

A fourth problem is that my method of calculation necessarily omits persons who were employed in the year prior to the census but not employed during the census week.[4] Since those who are, on average, less continuously employed may well have lower than average hourly earnings, their inclusion in the estimates of hourly earnings, if this were possible, might reduce the overall average by a few percent.[5] I doubt, however, whether the comparisons over time and space would be much affected.

Finally, when the wages of the workers in one industry are shown relative to the wages of workers in all industries (i.e., actual ÷ expected) a problem arises if the industry in question accounts for a significant fraction of the all-industry total. In such cases the ratio of wages in that industry to all other industries could be significantly different from the ratio to all industries.[6]

RESULTS, 1969

We begin with a comparison between the health industry as a whole and all nonfarm industries. As shown in Table 1, overall annual earnings and hourly earnings are substantially lower in health, but most of this differential disappears if comparisons are made within color-sex categories. Approximately 80 percent of the labor hours of allied health personnel are worked by females, compared with 35 percent for the "all industries"

reference group. The last row of Table 1 shows actual earnings divided by expected earnings, i.e., the standardized wage index. The value of .95 for "all" indicates that wages in health, adjusted for sex, color, age, and schooling, were 5 percent below the "all industry" norm in 1969. This differential was entirely attributable to the relatively low earnings of males in health; females' earnings were almost exactly at the "all industry" level.[7] It should be noted that females in the health industry work more hours per year than females in other industries, whereas the reverse is true for males. This is probably related to the sex difference in the standardized wage index.

In Table 2 we begin to disaggregate the health industry, first into workers in hospitals and those in other health settings, and then for white females by years of schooling. One striking result is the substantially higher earnings in hospitals, especially for females. Both white and nonwhite females in hospitals make about 10 percent more per hour than do females with similar age and schooling in other parts of the health industry, such as

TABLE 1 Earnings and Hours of Wage and Salary Workers[a] in the Health Industry and All Industries,[b] 1969

Category	All	White Males	White Females	Nonwhite Males	Nonwhite Females
Annual earnings (U.S.$)					
Health	4492	6498	4136	4956	4031
All industries	6294	8157	3954	5592	3444
Annual hours					
Health	1632	1837	1559	1841	1741
All industries	1769	1956	1495	1845	1554
Hourly earnings (U.S.$)					
Health	2.75	3.54	2.65	2.69	2.32
All industries	3.56	4.17	2.64	3.03	2.22
Expected hourly earnings[c]					
Health	2.89	4.20	2.69	3.10	2.28
Hourly earnings ÷ expected hourly earnings					
Health	.95	.84	.99	.87	1.02

SOURCE: The 1/1000 (for all industries) and 1/100 (for health) samples of the Census of Population. Calculations by the author. All ratios calculated from unrounded data.
[a] All data refer to wage and salary workers with 17 years of schooling or less.
[b] "All industries" always excludes agriculture, forestry, and fisheries.
[c] The earnings we would observe in health if each worker were paid at the "all industries" rate for given color, age, sex, and schooling.

TABLE 2 Average Hourly Earnings in Hospitals and Other Health, Actual and Relative to All Industries, 1969

Category	Actual		Expected		Actual ÷ Expected	
	Hospital	Other Health	Hospital	Other Health	Hospital	Other Health
All	2.81	2.60	2.91	2.85	.97	.91
White males	3.45	3.81	4.13	4.40	.84	.87
White females	2.75	2.46	2.70	2.66	1.02	.92
Nonwhite males	2.70	2.65	3.08	3.18	.88	.83
Nonwhite females	2.37	2.12	2.29	2.23	1.04	.95
White females Years of schooling:						
≤ 8	1.99	1.75	2.08	2.07	.96	.85
9–11	2.19	1.94	2.32	2.30	.94	.85
12	2.61	2.36	2.58	2.57	1.01	.92
13–15	3.17	2.85	2.86	2.87	1.11	.99
16	3.70	3.59	3.84	3.91	.96	.92
17	3.90	4.32	4.63	4.66	.84	.93

physicians' offices and nursing homes. Another striking result is the variation in the standardized wage index by years of schooling. Females with 12 or 13–15 years of schooling do particularly well in health.

Table 3 disaggregates the data by occupation (with several nonhealth occupations included to sharpen the comparisons), and again some interesting differences within the health industry emerge. Among the professional allied health personnel, registered nurses stand out with a wage index 19 percent above the "all industry" norm. By contrast, dietitians in health make 13 percent less than expected, given their age and schooling. Secretaries and other clerical workers in health have slightly higher expected earnings than their counterparts in other industries, but their actual

TABLE 3 Hourly Earnings in Selected Occupations, Health and Other Industries, 1969

Category	Hourly Earnings ($)		Actual ÷ Expected
	Actual	Expected	
White females			
Dietitians	2.79	3.20	.87
Registered nurses	3.53	2.96	1.19
Health technologists and technicians	3.07	2.88	1.07
Teachers, exc. college and university	4.32	3.95	1.09
Social and rec. workers, exc. health	3.29	3.49	.94
Librarians	3.84	3.93	.98
Secretaries—health	2.57	2.70	.95
Other clerical—health	2.37	2.62	.90
Secretaries—exc. health	2.81	2.67	1.05
Other clerical—exc. health	2.60	2.58	1.01
Practical nurses	2.49	2.57	.97
Nursing aides, orderlies, etc.	1.88	2.41	.78
Other service workers—health	2.03	2.42	.84
Hairdressers and cosmetologists	2.15	2.41	.89
Other service workers—exc. health	1.83	2.38	.77
Private household workers	1.39	2.27	.61
White males			
Health technologists and technicians	3.86	4.37	.88
Craftsmen and operatives—health	3.59	4.06	.88
Engineering and science technicians	4.30	4.24	1.01
Craftsmen and operatives—exc. health	3.87	3.86	1.00

earnings are about 10 percent lower. In the service group of occupations, practical nurses do surprisingly well, with hourly earnings almost equal to expected earnings. The other service occupations in health and other industries have rather low earnings, both absolutely and relative to expected earnings.

The two major male occupations show interesting and consistent comparisons between health and other industries. In both cases, the expected earnings figure (reflecting the age-schooling mix) is somewhat higher in health, but actual earnings are lower, yielding a standardized wage index 12 percent under the norm. One possible explanation, not explored in this paper, is that males engaged in these occupations in other industries tend to be far more heavily unionized than in health.

The data in Table 4 are disaggregated simultaneously by occupation and health setting. For some occupations, notably secretarial and other clerical, the setting is irrelevant; the standardized wage indexes are almost identical. Standardized earnings tend to be appreciably higher in hospitals than elsewhere for registered and practical nurses and nurses' aides, but not for technologists and technicians. Whether these differentials were also present in 1959 or emerged only in the course of the subsequent decade is one of the questions to be examined in the next section.

RESULTS: CHANGES FROM 1959 TO 1969

The ten years from 1959 to 1969 were very eventful ones for the health industry. During the first half of the decade, prices and expenditures were already rising at a rapid pace, primarily because of the development of more complex technology. After 1965 the pace accelerated appreciably under the double impact of massive federal health insurance programs and general economy-wide inflation. This decade also witnessed the beginnings of considerable union activity in hospitals, although the fraction of hospital workers covered by collective bargaining agreements in 1969 was still small compared with most industries.

Comparison of the standardized wage indexes for 1959 and 1969 reveals that wages of allied health manpower rose faster than wages in other industries, but that the pace of increase was very uneven for different groups within the health industry. As shown by the first row of Table 5, health workers were indeed poorly paid in 1959 relative to workers in other industries: the standardized wage index was .86. The increase to .95 by 1969 means that earnings in health relative to other industries rose by 11 percent over the decade. Nonwhite workers in health, however, showed no improvement relative to nonwhite workers in other industries because of the rapid gains made by nonwhites in the economy as a whole (reflected in the higher 1969/1959 indexes for expected earnings).

Table 5 also shows that the higher earnings of hospital workers relative

TABLE 4 Hourly Earnings Relative to Expected Earnings, White Females, by Occupation and Detailed Health Industry, 1969

Category	Hospitals	Physicians' Offices	Nursing Homes	Miscellaneous Health[a]
Registered nurses	1.24	1.03	1.02	1.13
Practical nurses	.99	.87[c]	.88	1.00[c]
Nursing aides, etc.	.82	[b]	.70	[b]
Technologists and technicians	1.01	1.05	[b]	[b]
Secretaries	.95	.96	.96[c]	1.37
Other clerical	.91	.89	.88	.95
				.90

[a]Dentists' offices, public health agencies, etc.
[b]Fewer than 50 observations.
[c]Fewer than 100 observations.

TABLE 5 Wage Indexes in Health, by Color and Sex, 1959, and Changes, 1959 to 1969

Group	1959 Actual ÷ Expected	1969 ÷ 1959 Actual	1969 ÷ 1959 Expected	1969 ÷ 1959 Actual ÷ Expected
All health				
All	.86	1.71	1.55	1.11
White males	.73	1.74	1.51	1.15
White females	.90	1.71	1.56	1.10
Nonwhite males	.87	1.76	1.77	.99
Nonwhite females	1.02	1.86	1.87	.99
Hospitals				
All	.86	1.77	1.57	1.12
White males	.72	1.75	1.52	1.16
White females	.90	1.78	1.58	1.13
Government	.97	1.68	1.58	1.07
Private	.87	1.84	1.58	1.16
Nonwhite males	.87	1.77	1.77	1.00
Nonwhite females	1.05	1.86	1.89	.99
Other health				
All	.86	1.59	1.50	1.06
White males	.77	1.66	1.48	1.12
White females	.89	1.58	1.52	1.04
Nonwhite males	.90	1.62	1.76	.92
Nonwhite females	.89	1.94	1.82	1.07

to other health workers in 1969 was entirely the result of changes during the decade. In 1959 the standardized wage indexes in the two health sectors were at the same level. Hospital wages rose faster than wages in all industries by slightly more than one percent per annum. While this differential cumulates to a substantial change in relative wages over a decade (12 percent), it is small relative to the inflation in hospital costs during that same period.[a] The differential rate of change between the hospital component of the CPI and the total CPI was over 6 percent per annum. 1959–1969. Thus, we see that the "catching-up" of hospital wages can account for only a small part of the explosion in hospital prices and expenditures. We also see in Table 5 that the rise in hospital wages was more rapid in the private sector than in government hospitals.

Changes in the wage indexes by occupation are presented in Table 6. Nurses, both practical and registered, stand out among the health workers as having experienced very substantial wage gains. Among the nonhealth occupations, only private household workers show a very large increase in standardized earnings.

It is noteworthy that every health occupation improved its relative position between 1959 and 1969, but for nurses' aides, clerical workers, and dietitians the gains were minimal. The two white male occupations showed substantial gains in wages, but still lagged behind similar workers in other industries.

The final table in this section (Table 7) shows changes by occupation in hospitals and in the rest of the health industry. Again we note a mixed pattern, with some occupations experiencing much larger increases in hospitals than elsewhere and some showing about the same change in the wage index regardless of setting. The gains made by practical and registered nurses in hospitals are particularly noteworthy and will be given further scrutiny in the next section.

REGIONAL DIFFERENTIALS IN HOSPITAL WAGES, 1959 AND 1969

One of the advantages of estimating earnings from the public use samples is that this permits calculating standardized wage indexes for different geographical areas within the United States. Information concerning regional differentials in wage levels and rates of change is of considerable importance for policy purposes, such as setting appropriate reimbursement rates for hospitals. These differentials also provide a basis for analyzing the determinants of wages and the responsiveness of hospitals to differentials in wage rates.

In Table 8 the standardized wage indexes for white females in the nine census divisions are presented for 1959 and 1969.[9] The regional compari-

TABLE 6 Wage Indexes, Selected Occupations in Health and Other Industries, 1959, and Changes, 1959 to 1969

Occupation	1959 Actual ÷ Expected	1969 ÷ 1959		Actual ÷ Expected
		Actual	Expected	
White females				
Dietitians	.86	1.60	1.58	1.01
Registered nurses	1.01	1.88	1.59	1.18
Health technologists and technicians	1.00	1.66	1.55	1.07
Teachers—exc. college and university	1.14	1.54	1.60	.96
Social and rect. workers—exc. health	.88	1.57	1.46	1.08
Librarians	.98	1.56	1.57	1.00
Secretaries—health	.92	1.57	1.51	1.04
Other clerical—health	.87	1.60	1.55	1.03
Secretaries—exc. health	1.11	1.45	1.53	.95
Other clerical—exc. health	1.04	1.50	1.55	.97
Practical nurses	.78	1.98	1.59	1.24
Nursing aides, orderlies	.76	1.63	1.58	1.03
Other service workers—health	.77	1.76	1.61	1.09
Hairdressers, cosmetologists	.90	1.52	1.53	.99
Other service workers—exc. health	.75	1.60	1.55	1.03
Private household workers	.47	2.04	1.56	1.31
White males				
Health technologists and technicians	.81	1.72	1.58	1.09
Craftsmen and operatives—health	.76	1.76	1.51	1.16
Engineering and science technicians	1.03	1.53	1.55	.99
Craftsmen and operatives—exc. health	.99	1.54	1.53	1.01

TABLE 7 Change in Standardized Hourly Earnings in Hospitals and Other Health, by Occupation, 1959 to 1969

| Category | $\dfrac{\text{Actual} \div \text{Expected } 1969}{\text{Actual} \div \text{Expected } 1959}$ | |
	Hospitals	Other Health
Registered nurses	1.21	1.09
Practical nurses	1.25	1.20
Nursing aides, etc.	1.07	.99
Technologists and technicians	1.04	1.17
Secretaries	1.04	1.04
Other clerical	1.04	1.02

sons in this section focus on white females in order to eliminate the possibility that sample variations in sex mix may bias the regional differentials. We know from Table 1 that the standardized wage index for males in health for the United States as a whole is substantially below that of females. If a region happened, by chance, to have relatively more males in its sample of health workers, its standardized wage index for health would tend to be depressed on that account even if wages for males and females taken separately were no different than in other regions.

One of the most powerful inferences to be drawn from Table 8 is that the geographical earnings differentials in hospitals and other health settings are very similar to those for all nonfarm industries. The coefficient of rank correlation between the "all industries" wage index and the hospital wage index is .88 in 1959 and .90 in 1969. The "all-industry"/"other health" coefficients are .90 and .80, respectively. This suggests that the relative wages of health workers in an area are probably determined by much the same forces that determine the general level of wages in the area, even when there are special factors affecting the national level of wages in health.[10] Thus, most of the ad hoc theories about special institutional factors influencing geographical differences in health wages are probably superfluous.

When we look at the rate of change in wages, however, as reflected in columns 7, 8, and 9 of Table 8, we see that special factors probably have been at work in some areas during the decade. The coefficients of rank correlation across the nine divisions for changes in wage indexes are .54 between "other health" and "all industries," and only .30 between hospitals and "all industries." There was very little regional variation in wage growth for "all industries," but considerable variation for hospitals. Particularly in the Northeast (New England and Middle Atlantic) and the Southeast (South Atlantic and East South Central), hospital wages have risen faster than in the rest of the country. The change in the West South Central was

TABLE 8 Standardized Wage Indexes (Actual ÷ Expected), White Females, Hospitals, Other Health, and All Industries, by Census Division, 1959 and 1969

Census Division	1959			1969			1969 ÷ 1959		
	Hospitals	Other Health	All Industries	Hospitals	Other Health	All Industries	Hospitals	Other Health	All Industries
New England	.95	.89	1.01	1.13	1.00	1.01	1.18	1.12	1.00
Middle Atlantic	.96	.95	1.11	1.11	1.00	1.12	1.16	1.05	1.01
East North Central	.94	.97	1.07	1.03	.96	1.04	1.10	.99	.97
West North Central	.82	.74	.88	.93	.78	.91	1.13	1.05	1.03
South Atlantic	.81	.82	.93	.98	.93	.94	1.22	1.13	1.01
East South Central	.76	.79	.84	.87	.84	.86	1.15	1.06	1.02
West South Central	.79	.80	.87	.86	.82	.86	1.09	1.02	.99
Mountain	.88	.83	.89	.92	.83	.90	1.04	1.00	1.01
Pacific	1.00	.97	1.07	1.09	.99	1.06	1.09	1.02	.99

similar to that in the Mountain and Pacific and these three divisions are grouped as West' in subsequent tables.

When the differential pattern of change is explored in greater detail (Table 9), we see that wages rose more rapidly in the two eastern regions than in the rest of the country in every major hospital occupation. The magnitude of the geographical differential, however, was very different across occupations. For registered nurses the rate of wage increase was similar across the country, varying by only .3 percent per annum from the highest to the lowest region. For other professional and managerial workers and for practical nurses, however, the differential was more than 2 percent per annum. The other two occupations show differences of over 1 percent per annum between the fastest- and slowest-growing regions.

The more rapid growth of hospital wages in the East revealed by the public use samples is confirmed by two other independent data sources. From American Hospital Association statistics it is possible to calculate average annual earnings per full-time-equivalent personnel in 1959 and 1969. The average annual percentage rate of change of this measure in "community" hospitals[11] is: Northeast, 6.5, North Central, 5.2, Southeast, 5.8, and West', 5.1. These figures are very similar to the changes in the standardized wages of white females calculated from the census public use samples.

Martin Feldstein has used Bureau of Labor Statistics wage survey statistics to calculate indexes of weekly wages for four metropolitan areas (one in each region) in 1960 and 1969.[12] The implied average annual percentage rate of change is: New York City, 7.8, Cleveland, 6.0, Baltimore, 7.2, and San Francisco, 5.9. The differentials across the metropolitan areas are similar to those revealed in the census data and the AHA statistics, but the rates of change are appreciably higher in the BLS data. This difference should be investigated.

CHANGES BEFORE, AFTER, AND DURING THE 1960s

We have seen that health workers, starting at a relatively low wage level in 1959, had risen by 1969 to a point of almost parity with other industries. Indeed, some health workers, especially those in hospitals and most particularly registered nurses, had reached standardized wage indexes far above unity by then. The evidence of a "catching up" in the 1960s is unmistakable, but there are several related questions which we would also like to answer: Were wages rising faster in hospitals than in other industries prior to 1959? Did the differential increase persist after 1969? And, perhaps

TABLE 9 Average Annual Rate of Change (percent) of Wages (adjusted for age and schooling) of White Females, 1959 to 1969 by Region, Selected Industries and Occupations

Category	U.S.	Northeast	North Central	Southeast	West
All industries	4.3[b]	4.4	4.2	4.5	4.2
Other health	4.6	5.0	4.3	5.3	4.4
Hospitals	5.5	5.8	5.3	6.1	5.1
Registered nurses[a]	6.2	6.3	6.0	6.3	6.2
Other prof. and mgrl.[a]	5.5	5.9	5.4	6.6	4.5
Practical nurses[a]	6.5	7.3	5.8	8.0	5.6
Other services[a]	5.1	5.5	4.8	6.2	4.6
Clerical[a]	4.7	5.0	4.6	5.3	4.1
Government[a]	5.0	5.5	4.3	5.9	4.7
Private[a]	5.8	6.0	5.8	6.2	5.3

[a] In hospitals.
[b] Actual hourly earnings increased by 4.5 percent per annum, but .2 percent per annum was due to a change in the age-schooling mix.

most important of all, was the differential evident throughout the 1960s or was it concentrated in the Medicare-Medicaid period (after 1965)? These questions cannot be answered with the census public use samples, which are available only for 1959 and 1969.

To answer them we turn to the American Hospital Association data on annual earnings per full-time-equivalent employee. These measures are not standardized for sex, schooling, or other characterisitcs; they reflect changes in employment mix well as changes in standardized wages. In order to reduce the problem of changes in mix, wages are calculated for one type of hospital, the so-called "community" hospital. Wage changes in these hospitals are compared with changes in gross hourly earnings of all private nonagricultural wage and salary workers in production or non-supervisory jobs.

The results, presented in Table 10, are quite striking. We see that wages were rising faster in hospitals than in the economy as a whole in the 1950s and 1970s as well as in the 1960s, although the differential was largest in that decade. For the quarter century 1949–1975, the average differential was 1.3 percent per annum, with a cumulative improvement in the relative wages of hospital workers over the entire period of some 37 percent!

Perhaps the most interesting result is that the differential wage increase was almost identical in 1959–1965 and 1965–1969. This is not to say that the advent of Medicare and Medicaid had no effect on hospital behavior (see below), but the effect on wages was apparently not great.

TABLE 10   Rates of Change of Hospital Wages, Expenditures, and Other Variables, Selected Periods, 1949–74 (percent per annum)

Category	1949–59	1959–65	1965–69	1969–74
1. Hospitals, earnings per F.T.E. [a]	5.8	4.7	7.0	7.4
2. Private nonagricultural	4.6	3.2	5.4	6.6
3. Excess change in hospital wages, (1) minus (2)	1.2	1.5	1.6	0.8
4. Expenditures per patient-day	7.3	6.8	11.3	12.1
5. Consumer Price Index, all items	2.0	1.3	3.8	5.9
6. Excess of hospital expenditures per patient-day over CPI, (4) minus (5)	5.3	5.5	7.5	6.2
7. Payroll per patient-day	8.4	6.7	10.2	10.5
8. Nonpayroll per patient-day	5.6	7.0	13.0	14.2

SOURCES: *AHA Hospital Guide*, various issues; *Economic Report of the President*, January 1976.
[a] All hospital data refer to nonfederal short-term general and other special hospitals.

The next three rows of Table 10 show rates of change in expenditures per patient-day in community hospitals compared with the change in the consumer price index for all commodities. Hospital costs outpaced the CPI by a substantial margin in all periods, and the differential was particularly large in 1965–1969. In no period does the faster growth of wages in hospitals account for more than a small part of the rapid rise in hospital expenditures per patient-day. For the quarter century as a whole, it appears that the catching-up of hospital wages accounted for about 13 percent of the differential between hospital expenditures and the CPI.[13]

The last two rows of Table 10 show that in the 1950s the growth of hospital expenditures was paced by rapid increases in payrolls, but that in recent years nonpayroll expenses have been increasing even more rapidly than labor costs. The huge increase in resources devoted to hospitalized patients in recent years is said to represent "higher quality" care, but the evaluation of that claim is far beyond the scope of this paper.

CONCLUSION

On the basis of the data presented here a partial answer can be made to the question posed in the title—health workers are not, on average, paid less than workers of the same sex, color, age, and schooling in other nonfarm industries. To be sure, adjustment for color, age, sex, and schooling does not provide a completely standardized wage comparison. Workers may differ significantly in other respects, such as type of schooling or amount of on-the-job training, and jobs may differ in the value of fringe benefits, pleasantness of working conditions, and the like. Some registered nurses, for instance, may have received a great deal of training in hospitals which they did not report as years of schooling. Moreover, the approximate average equality revealed in this paper does encompass some significant relative differentials within the health field. For example, females do relatively better than males, hospital workers do better than workers in other health settings, and those in some occupations, especially registered nurses, earn much more than workers in other occupations even after standardization for years of schooling.

The data also indicate very clearly that this equality has been achieved since 1959. At that time the standardized wage indexes for both hospital workers and those in other health settings were 14 percent below the all-industry norm. There was a substantial "catching up" in the 1960s and a persistence of this differential rate of growth, at least for hospitals, in the 1970s. The earnings of hospital nurses, both registered and practical, stand out as having experienced the most rapid rates of increase.

We have also seen that this "catching up" was evident in the 1950s, too, and that the differential growth of hospital wages was as large prior to

Medicare and Medicaid as after these programs were introduced. For the quarter century 1949–1974 the earnings of hospital workers improved about 37 percent compared with those of all private nonagricultural workers. This relative wage gain, however, explains only a small part of the very rapid rise in the cost of a day of hospital care relative to other prices.

Another conclusion of this study is that geographical differentials in health wages are closely correlated with geographical differentials in all nonfarm wages. If, for instance, we know the national wage index for hospital workers and the regional wage index for all nonfarm workers, we can predict with considerable accuracy the hospital wage index in that region. There was, however, some significant variation in the rate of growth of hospital wages across regions, notably for wages in the East, which rose faster than in the Middle or Far West in the 1960s. The rapid wage gains were accompanied by above-average rates of growth in hospital employment per capita in the Southeast, but by relatively slow growth in the Northeast. The next task is to explain systematically the variations in rates of change of hospital wages across regions, occupations, and health settings, and to analyze the industry's response to these variations.

APPENDIX

TABLE A-1 Number of Observations [a]

Category	All Health 1960	All Health 1970	Hospitals 1960	Hospitals 1970
All	19,288	34,489	14,492	23,630
Color-Sex				
White males	3,178	4,988	2,540	3,782
White females	13,191	23,851	9,446	15,399
Nonwhite males	877	1,205	803	1,014
Nonwhite females	2,042	4,445	1,703	3,435
White Female—(census division)				
Northeast	1,153	1,927	833	1,293
Middle Atlantic	2,468	4,137	1,770	2,749
East North Central	2,758	5,016	2,031	3,282
West North Central	1,395	2,626	1,058	1,681
South Atlantic	1,476	2,830	1,022	1,822
East South Central	636	1,159	474	785
West South Central	1,003	1,925	704	1,170
Mountain	555	1,045	400	686
Pacific	1,747	3,186	1,154	1,931
Age				
14-19	889	1,660	629	907
20-24	1,803	4,042	1,343	2,808
25-34	2,513	4,354	1,822	2,907
35-44	2,781	4,396	1,935	2,745
45-54	2,908	4,979	2,086	3,196
55-64	1,819	3,593	1,313	2,354
65+	478	827	318	482
Schooling				
≤ 8	1,970	2,230	1,517	1,366
9-11	2,090	3,305	1,528	2,075
12	4,812	9,561	3,241	5,934
13-15	3,316	6,669	2,433	4,513
16	807	1,659	580	1,212
17	196	427	147	299
Occupation				
Registered nurse	3,959	5,928	3,178	4,521
Other professional and mgrl.	2,840	3,820	1,186	1,913
Practical nurses	950	1,461	627	1,099
Other service	3,103	7,672	2,586	4,330
Clerical	3,207	5,476	1,503	3,157

[a] Wage and salary workers with less than 18 years of schooling employed in the census week, with earnings in the previous year.

TABLE A-2 Actual and Expected Hourly Earnings in 1959

Category	All Health		Hospitals		Other Health	
	Actual	Expected	Actual	Expected	Actual	Expected
White males	2.03	2.77	1.97	2.72	2.29	2.97
White females	1.55	1.72	1.54	1.71	1.56	1.75
Nonwhite males	1.53	1.75	1.52	1.74	1.64	1.81
Nonwhite females	1.24	1.22	1.27	1.21	1.09	1.22
All	1.61	1.87	1.59	1.86	1.64	1.90

TABLE A-3   Actual and Expected Hourly Earnings in 1959 for Selected Occupations

Category	Actual	Expected
White Females		
Dietitians	1.75	2.03
Registered nurses	1.88	1.86
Health technicians	1.84	1.85
Teachers, exc. college, university	2.81	2.47
Social and recr. workers, exc. health	2.10	2.40
Librarians	2.45	2.50
Secretaries—health	1.64	1.79
Other clerical—health	1.48	1.70
Secretaries—exc. health	1.94	1.75
Other clerical—exc. health	1.73	1.67
Practical nurses	1.26	1.61
Nursing aides, orderlies	1.16	1.53
Other service workers—health	1.15	1.50
Hairdressers and cosmetologists	1.42	1.57
Other service workers—exc. health	1.14	1.53
Private household workers	.68	1.45
White Males		
Health technicians	2.24	2.76
Craftsmen and operatives—health	2.04	2.68
Engineering and science technicians	2.81	2.73
Craftsmen and operatives—exc. health	2.51	2.53

TABLE A-4 Actual and Expected Hourly Earnings for White Females, Hospitals and Other Health, by Census Division, 1959 and 1969

	Actual				Expected			
	Hospitals		Other Health		Hospitals		Other Health	
Census Division	1959	1969	1959	1969	1959	1969	1959	1969
New England	1.63	3.02	1.53	2.66	1.71	2.68	1.71	2.66
Middle Atlantic	1.63	3.00	1.68	2.67	1.69	2.70	1.77	2.68
East North Central	1.58	2.76	1.67	2.51	1.68	2.67	1.72	2.68
West North Central	1.38	2.50	1.28	2.04	1.68	2.69	1.72	2.61
South Atlantic	1.39	2.64	1.44	2.49	1.72	2.69	1.72	2.61
East South Central	1.29	2.42	1.34	2.22	1.70	2.66	1.75	2.68
West South Central	1.36	2.27	1.39	2.13	1.73	2.65	1.68	2.64
Mountain	1.55	2.57	1.47	2.27	1.75	2.79	1.74	2.62
Pacific	1.74	3.09	1.78	2.71	1.78	2.83	1.78	2.75
							1.82	1.75

NOTES

1. See, however, studies by Altman [1970], Benham [1971], Ehrenberg [1974], M. Feldstein [1971], and Yett [1970].
2. The pioneering work of Friedman and Kuznets [1945] was followed by many other studies, e.g. Hansen [1964], Benham, Maurizi, and Reder [1968], and Sloan [1970].
3. Except for very young workers. See Michael Hurd [1971].
4. This point was made to me by Giora Hanoch.
5. Assume that 15 percent of the workers who had earnings in 1969 were not employed in the census week in 1970. Assume that compared with those workers who were employed both in 1969 and the census week in 1970, their annual hours were 40 percent less and their average hourly earnings were 25 percent less. Their inclusion, if possible, would have lowered average hourly earnings by a bit over 2 percent.
6. If we know the ratio to all industries (X) and we know the fraction of total employment (n) accounted for by the industry in question, then the ratio to all other industries (A) is given by

   $$A = (X - nX) \div (1 - nX).$$

   If X is fairly close to one and n is fairly close to zero, then the ratio to all other industries is approximately

   $$A = X + n(X - 1).$$

   Thus, if $X = 1.10$ and $n = .1$, then $A = 1.112$. If $X = 1.10$, $n = .2$, then $A = 1.128$. If $X = 1.20$, $n = .1$, then $A = 1.227$. For the health industry as a whole, $n = .06$, but for the category "white females, 13–15 years of schooling," $n = .18$.
7. The tendency for male earnings to be low in industries and occupations that are predominantly female is not limited to the health field. In an earlier study of sex differentials in earnings across 46 industries, I found that, ceteris paribus, hourly earnings of males decreased .2 percent for every one percentage point increase in the female share of industry employment. [Fuchs, 1971]
8. See p. 425 for a more complete discussion of this point.
9. For the actual and expected hourly earnings by division, see Appendix Table A-4.
10. The major exception is hospital wages in New England in 1969, which were the highest in the country, although wages in other New England industries were at the national average.
11. I.e., nonfederal short-term general and other special hospitals.
12. See M. Feldstein [1971].
13. The differential between expenditures and the CPI is 5.85 percent per annum. The differential growth of wages is 1.27 percent. Payrolls are about 60 percent of total expenditures. (.60)(1.27) ÷ (5.85) = .13.

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