

Some Trends in Worker Access to Health Care in the United States (1974-1983)

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As a result of national surveys of occupational health and safety conditions in the American workplace, the National Institute for Occupational Safety and Health (NIOSH) has collected data on the provision of health care to workers as a consequence of their employment. Two of these surveys, initiated in 1972 and 1981, permit a preliminary examination of the trends in worker access to such care.

This paper presents data on the provision of some aspects of medical care to workers in manufacturing and nonmanufacturing facilities as a result of employment. Among the principal findings are increases in general health care provided to workers, increased use of off-site physicians, and increased use of screening examinations or tests. Other analyses indicate a decreased use of on-site physicians and pre-employment examinations and decreased industrial retention of health information on new employees.

Key words: occupational health care trends, occupational physicians, preventive medicine, screening tests, industrial pre-employment examinations and record keeping

INTRODUCTION

Continuing interest in the prevention and control of disease associated with employment is readily apparent in the current literature [Heath, 1987; Chenowith, 1987] and in the ongoing efforts of such national organizations as the Association of Schools of Public Health [ASPH, 1986] and the Centers for Disease Control [CDC, 1987]. Despite this interest, little is known about worker access to health care personnel and services in the American workplace, although efforts have been made [NIOSH, 1978]. While some data on the practice of medicine in general are available [NCHS, 1985], these do not specifically reflect occupational health practice. Further, the trends in worker access to health care resulting from their employment since the passage of the Occupational Safety and Health Act of 1970 are virtually unknown, despite the overall intents of the act, as described by Walker [1984].

Part of the data gathered during two national surveys of the American workplace by the National Institute for Occupational Safety and Health (NIOSH) concerned the

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industrial provision of health care in both 1972-74 and 1981-83. Since these two surveys were cross-sectional representations of American industrial facilities, analysis of the data permits estimates of the number of industrial facilities in the nation that provide specific types of health care to their workers, as well as estimates of the number of workers employed in such facilities. Comparison of the estimates from these two surveys provides a preliminary examination of the trends in occupational health care.

METHODS

The National Occupational Hazard Survey (NOHS) initiated in 1972 and the National Occupational Exposure Survey (NOES) initiated in 1981 were separate 2-year cross-sectional surveys of industry intended to describe health and safety conditions in the American workplace. The sampling frames for both surveys were generally defined as those industrial facilities in the private sector with eight or more workers covered under the Occupational Safety and Health Act of 1970. Both surveys consisted of a probability sample of business facilities selected by a stratified, multi-stage sampling plan that considered geographical location, industry type by Standard Industrial Classification [OMB, 1978], and number of employees per facility. The 1972 NOHS sample consisted of 4,636 facility visits in 67 metropolitan areas [NIOSH, 1977], while the 1981 NOES sample consisted of 4,490 facility visits in 98 geographical areas [Sieber, 1985; NIOSH, pending]. Each site visit consisted of two parts: administration of a standardized survey questionnaire, conducted in interview format by a NIOSH employee; and a walk-through survey of the facility that resulted in an inventory of the chemical and physical agents present in the work environment. The data presented in this paper are extracted from facility management responses to the questions contained in the medical services section of the NOHS and NOES questionnaires as recorded by the NIOSH surveyors during the conduct of the interview phase of each site visit. Data from the questionnaire were used as the bases for national estimates of the number of facilities that have specific characteristics, such as on-site physicians and the number of workers employed in these facilities.

For purposes of the analyses presented in this paper, two data selection procedures were performed. First, because health care provision in the health services industry (Standard Industrial Classification 80) is different from that of any other industrial sector, data from that industry were deleted from consideration. Second, the NOES sampling strategy eliminated 24 of the 65 Standard Industrial Classifications sampled in the NOHS in order to concentrate available resources on those industries tentatively identified as environments in which potential worker exposure to chemical, physical, or biological agents was most likely. Therefore, in order to analyze comparable industrial environments, NOHS data from these 24 industrial categories (primarily in the wholesale/retail trade and financial/real estate/insurance industries) were omitted from our analysis.

These steps resulted in the selection of 4,016 of 4,636 NOHS facility visit records and 4,258 of the 4,490 NOES records. The selected facilities from the NOHS data employed a total of 813,363 workers, while the NOES facilities selected employed 1,572,638. Statistical estimates of the national number of facilities and workers represented by these samples are 437,335 facilities employing 26,265,143 workers

for the NOHS sample and 501,630 facilities employing 29,750,228 workers for the NOES sample. The list of industries in this common universe is displayed in Table I.

RESULTS

The medical services section of the NOHS and NOES questionnaires contain questions on topics ranging from provision of specific areas within the facility reserved for the medical care of workers to the provision of medical tests and examinations, including health-related record keeping. The responses to these questions reflect facility management policy with regard to the provision of health care personnel or services for the employees in each facility surveyed. Many analyses of these data are possible and will be the subjects of future NIOSH reports; those presented here were selected as an overview of the characteristics of health care provided in American industry in the 1972–74 and 1981–83 time periods, reflecting the changes in the decade since the passage of the Occupational Safety and Health Act [OSHA, 1970].

Worker Access to General Health Care

General health care is specifically defined for this paper and is included to examine worker access to any of a broad spectrum of the elements of health care. It is defined here as the provision, by facility management policy, of one or more of the following: an on-site area or room intended only for examinations or treatment (health units), an on-site (employed or contract) physician, an on-site nurse, one or more specified medical tests or examinations (primarily screening tests), or immunizations.

Analysis of these data from the two surveys indicates a 1974–1983 estimated increase of 2,275,800 workers with access to at least some health care as a consequence of their employment. The total number of facilities offering some form of health care increased by an estimated 21,175. Expressed as a percent of the total population, the proportion of industrial facilities offering at least some aspect of general health care changed very little in the 10-year period (from 18.4 to 20.3%). Similarly, the estimated proportion of the workforce with access to general health care increased by only 1.3% (from 54.5 to 55.8%).

Masked in these totals, however, are differences in the provision of health care to those who work in the manufacturing sector compared with those in nonmanufacturing. Analysis of general health care provisions by manufacturing facilities (classifications 20–39, Table I) indicates increases in the proportion of facilities (from 24.7 to 27%) and workers (from 68.1 to 68.7%) where health care is related to employment. Comparable estimates for nonmanufacturing show decreases in the proportion of facilities (from 15.4 to 13.5%) and workers (from 35.9 to 32%). As displayed in Figures 1 and 2, these changes are not large, but appear to represent a decrease in the provision of health care in the nonmanufacturing sector.

This analysis is very broad, as the definition of general health care incorporated many aspects of health care. Accordingly, analysis of the individual aspects of health care combined within this general definition were performed.

Worker Access to Physician Services

For the combined manufacturing and nonmanufacturing sectors, physician services provided to the workforce as a whole increased from approximately 31 to 73 hr

TABLE I. Industrial Groups Included in NOHS/NOES Trend Analysis by Standard Industrial Classification (SIC) and Description

SIC	Description	SIC	Description
07	Agriculture services	35	Machinery, except electrical
13	Oil and gas extraction	36	Electric and electronic machinery
15	Building construction	37	Transportation equipment
16	General contractors	38	Measuring, analyzing, and control instruments
17	Special trade construction	39	Miscellaneous manufacturing
20	Food and kindred products	41	Local and suburban transit
21	Tobacco manufacturers	42	Motor freight transportation
23	Apparel and other finished products	45	Transportation by air
24	Lumber and wood products	46	Pipe lines, except natural gas
25	Furniture and fixtures	47	Transportation services
26	Paper and allied products	48	Communications
27	Printing, publishing and allied industries	49	Electric, gas, and sanitary services
28	Chemicals and allied products	50	Wholesale trade — durable goods
29	Petroleum refining and related industries	51	Wholesale trade — nondurable goods
30	Rubber and miscellaneous plastics products	55	Automotive dealers and service
31	Leather and leather products	72	Personal services
32	Stone, clay, glass, and concrete products	73	Business services
33	Primary metal industries	75	Automotive repair, services, and garages
34	Fabricated metal products	76	Miscellaneous repair services

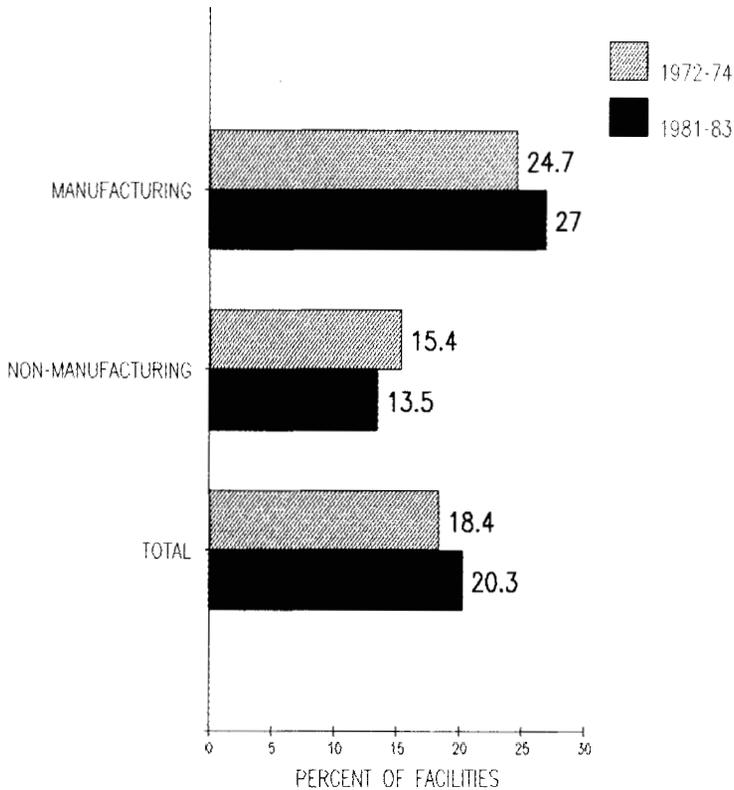


Fig. 1. Proportion of industrial facilities providing general health care to workers.

per week per 10,000 workers. Increases of approximately 43–82 (manufacturing) and 15–57 (nonmanufacturing) hr per week per 10,000 workers were noted. In addition, the estimated number of workers with access to an on-site physician has increased from about 5,460,000 in 1974 to 5,668,000 in 1983, or approximately 228,000. However, this represents a decrease from approximately 21% of the estimated 1974 workforce to 19% of the estimated 1983 workforce.

While the amount of physician time per worker appears to be increasing, there are interesting differences in the way that such care was provided to the workforce in 1974 and 1983. As shown in Figure 3, the estimated proportion of the workforce with access to an on-site physician (employed or contract) appears to have declined slightly from 20.8 to 19.6%, while the provision of physician care to workers through contractual arrangements with off-site clinics seems to have increased dramatically from 19.1 to 57.8%. This agrees with the concerns of the occupational health workforce about shrinking employment opportunities for industrially based physicians expressed by Tepper [1987]. His statements about the changing role of the occupational health physician appear to be borne out by the decreasing proportions of the workforce with on-site access to a health unit staffed at least part-time by a physician. Specifically, the estimated proportions of the total workforce with on-site access to a health unit with a physician in charge at least part-time decreased from approximately 17.6% in 1974 to 14.2% in 1983. In the manufacturing sector, this type of worker

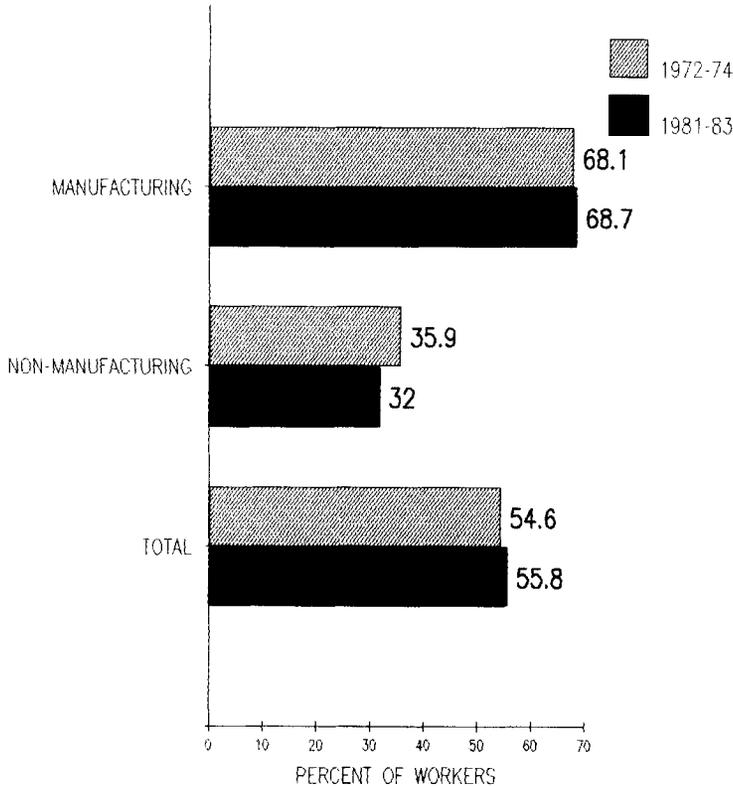


Fig. 2. Proportion of the workforce employed in facilities providing general health care.

access to physician services decreased from about 24.8% of the workforce to 20.5%, while in nonmanufacturing, the decrease was from around 7.7 to 2.5%.

Worker Access to Nurse Services

Expressed in hours of nurse (RN or LPN) time per week per 10,000 workers, estimated occupational access to nurse care has increased from approximately 199 hr per week in 1974 to 266 in 1983. Increases of approximately 49–152 (nonmanufacturing) and from 309 to 329 hr (manufacturing) were noted.

The estimated number of workers in facilities that employed nurses to provide health care to employees increased from approximately 8,209,000 in 1974 to 9,137,000 in 1983, but this represents a slight decline of about 0.5% in the proportion of the workforce with on-site access to nurse services. The proportions of the workforce with access to on-site nurses are displayed in Figure 4.

The apparent contradiction between the increased number of nurse hours provided and the decreased proportion of the workforce with on-site access to nurse care can be explained by noting that the survey questions on nurse hours devoted to health care in industrial facilities did not differentiate between on-site and off-site care. Given the previously noted increase in the use of off-site clinics for access to physician care, it appears reasonable to assume that this may also account for the increases in nurse hours. In addition, the estimated proportion of all facilities employing nurses to provide health care increased slightly from approximately 1.7% in 1974 to 2.2% in

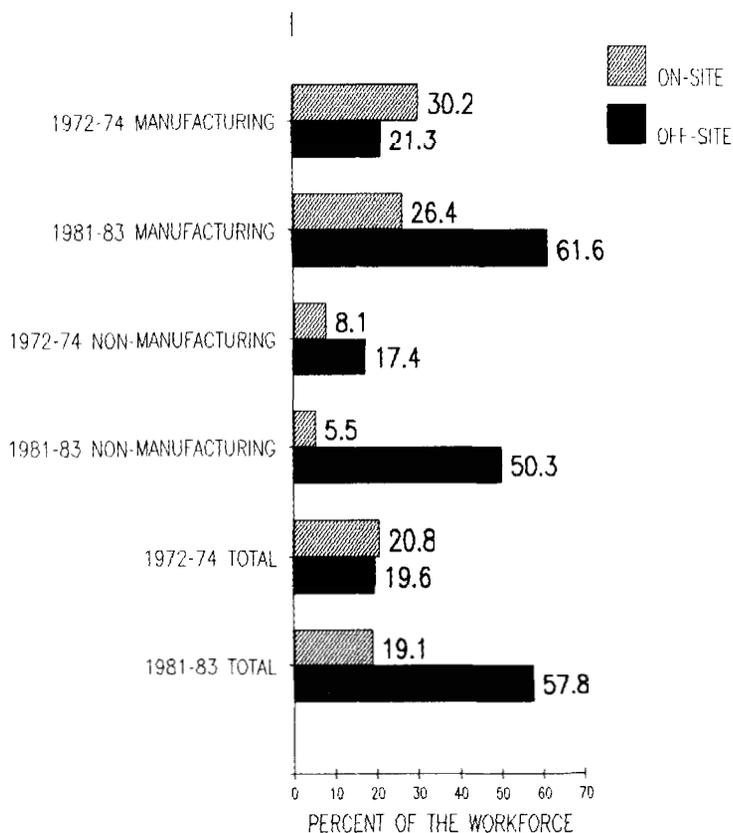


Fig. 3. Worker access to physician services.

1983, indicating that additional nurse hiring did take place, but in relatively smaller facilities, which would have affected the total workforce proportions to a smaller degree than would similar hiring patterns in larger facilities.

Change in nurse activities in the occupational setting, from the traditional treatment role to one of health assessment and preservation, has been under discussion for some time. Harris [1985] discussed the potential for such a change, which would blur existing divisions among roles for physicians, nurses, and other occupational safety and health specialists. In this context, it is interesting to note that while physician presence in on-site health units appears to be decreasing overall, analysis indicates that worker access to nurse-run health units is increasing. Specifically, the estimated proportion of the total workforce with access to an on-site health unit with a nurse in charge increased by 3.5% (from approximately 12.7% in 1974 to 16.2% in 1983). In the manufacturing sector, the proportion of the workforce with this type of nurse access increased by about 3.6%, as opposed to 0.2% in nonmanufacturing.

Worker Access to First-Aid Personnel

One obvious concern of a company-sponsored health plan is to provide emergency first aid for any injured worker. The NIOSH survey data indicate that the on-site presence of personnel with formal first-aid training (including paramedics) during at least part of the hours of facility operation increased from 1974 to 1983. Overall,

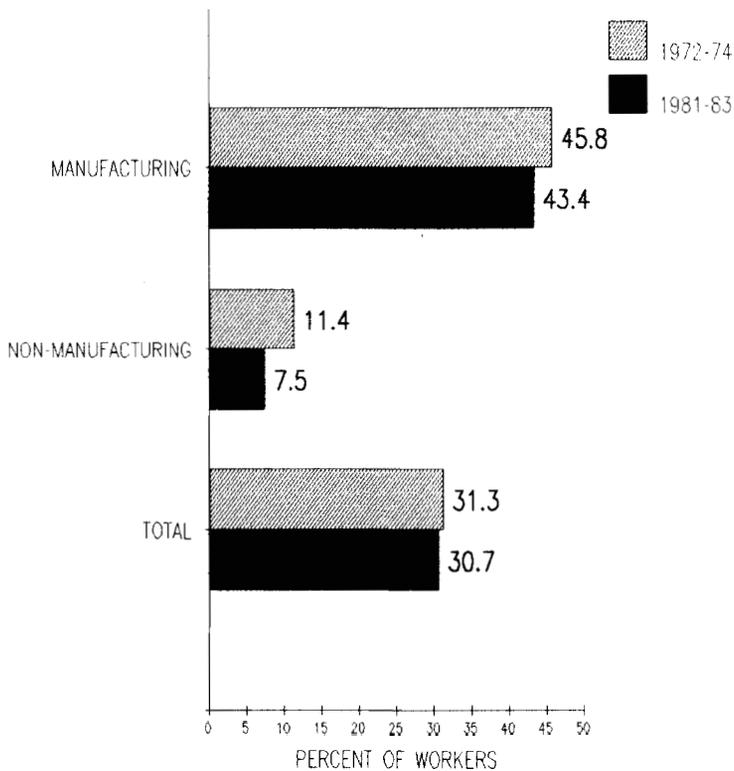


Fig. 4. Proportion of the workforce employed in facilities with nurses to provide health care

the estimated proportion of industrial facilities with such personnel on-site increased from approximately 33.3 to 37.3%, and the estimated proportion of the workforce employed in such facilities increased from approximately 62.5 to 66.8%, as displayed in Figure 5.

In the manufacturing sector, the estimated proportion of facilities with trained first-aid personnel increased from 42.3% in 1974 to 46.1% in 1983, while the proportion of the workforce employed in such facilities increased from 74.6% in 1974 to 76.8% in 1983. The proportion of the nonmanufacturing facilities employing such individuals decreased from about 29 to 26.8% from 1974 to 1983, but the estimated proportion of the workforce with access to on-site first-aid personnel rose from 45.7 to 48.4%.

It appears that health units staffed only by paramedics or other formally trained first-aid personnel are becoming more common. The estimated number of facilities utilizing such personnel to operate their health units increased from 9,075 to 14,968 and proportionately from about 2.1 to 3.0% from 1974 to 1983. The proportion of the workforce employed in such facilities rose from about 6.0 to 7.5% over the same time period.

Worker Access to Screening Tests

Recent literature points out the range of current opinion about the proper administration of screening tests to industrial populations. Certain authors advocate

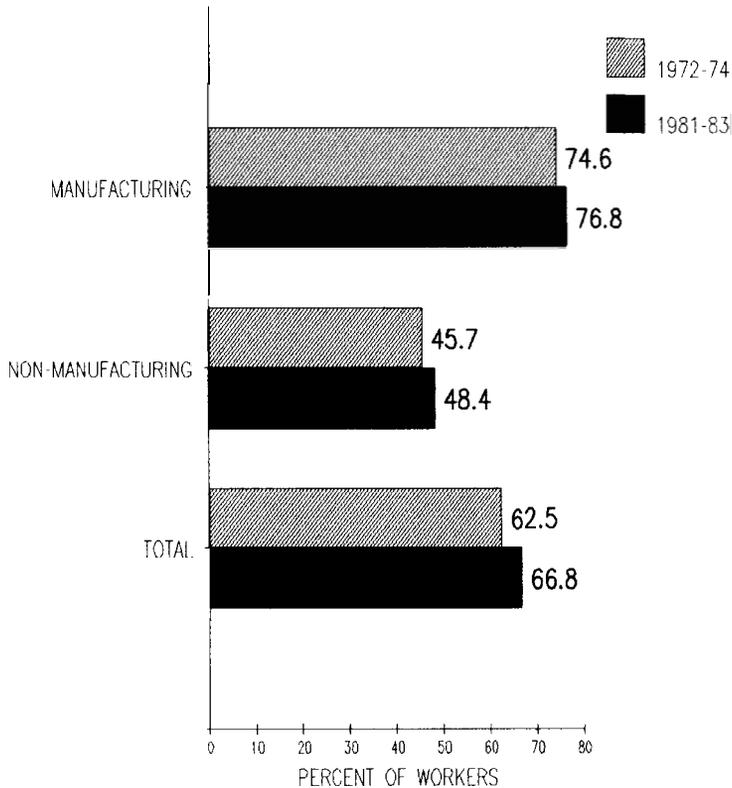


Fig. 5. Proportion of the workforce employed in facilities with first-aid personnel

general testing as cost-effective, and spell out, for example, the proper conduct of audiology [Šataloff et al., 1987] or pulmonary [Young, 1987] testing programs in specific situations. Others endorse a reliance on a policy of reinforcing good health habits, such as the “Alameda 7” discussion by Schoenborn [1986]. Alternatively, the Harris et al. [1986] study of health risks in an employed population or the principles suggested by Halperin and Ratcliffe [1986] for medical screening or biological monitoring in the workplace recommend that screening tests need to be conducted on a systematic basis, involving both the careful selection of necessary tests and follow-up activities based on critical evaluation of screening data and health histories.

In the context of these varied viewpoints, an analysis of trends in actual industrial application of screening procedures is of particular interest. There are six screening procedures on which data were gathered in both the NOHS and NOES surveys. These are ophthalmology, audiology, blood tests, urine tests, pulmonary function tests, and chest X-ray procedures. Also included in this battery of common tests is the provision of immunizations.

For purposes of the analyses presented here, corporate provision of these tests or procedures to all workers, production workers, or selected management/production workers is defined as worker access to screening tests provided by employers. This definition excludes those facility or worker populations where screening tests were either not provided or were provided only to management personnel.

Estimates of the number of facilities providing one or more of the battery of common tests mentioned above, and of workers in those plants, indicate an increase from about 17,000 facilities in 1974 to around 91,000 in 1983. A corresponding increase of approximately 670,000 workers to about 14.8 million in 1983 was noted. This represents an increase of about 1.2% in the proportion of all facilities providing such tests (from 16.9 to 18.1%) and a 3.6% increase in the proportion of the workforce (from 46.3 to 49.9%) with access to at least one screening test. Similar 1974–1983 increases were noted in manufacturing (1.8% increase in facilities from 21.5 to 23.3%, and 3.4% of the workforce from 57.9 to 61.3%). Conversely, data on the nonmanufacturing sector showed an estimated decrease of 2.2% (from 14.7 to 12.5%) of the facilities offering one or more screening tests and a 1.4% decrease (from 30.4 to 29%) in the proportion of the workforce with access to screening tests.

The overall trends in worker access to specific screening tests are displayed in Figure 6. Of the seven tests or procedures for which trend analysis was possible, only the provision of immunizations decreased for both the manufacturing and nonmanufacturing sectors. In 1974, an estimated 29,250 facilities employing 6,413,000 workers provided immunizations to at least some portion of the nonmanagement workforce. In 1983, this had decreased to about 16,100 facilities employing approximately 4,068,000 workers. Expressed as proportions of the 1974 and 1983 workforce, this represented a decline from 24.4 to 13.7% of the workforce that was provided with immunizations as a consequence of employment.

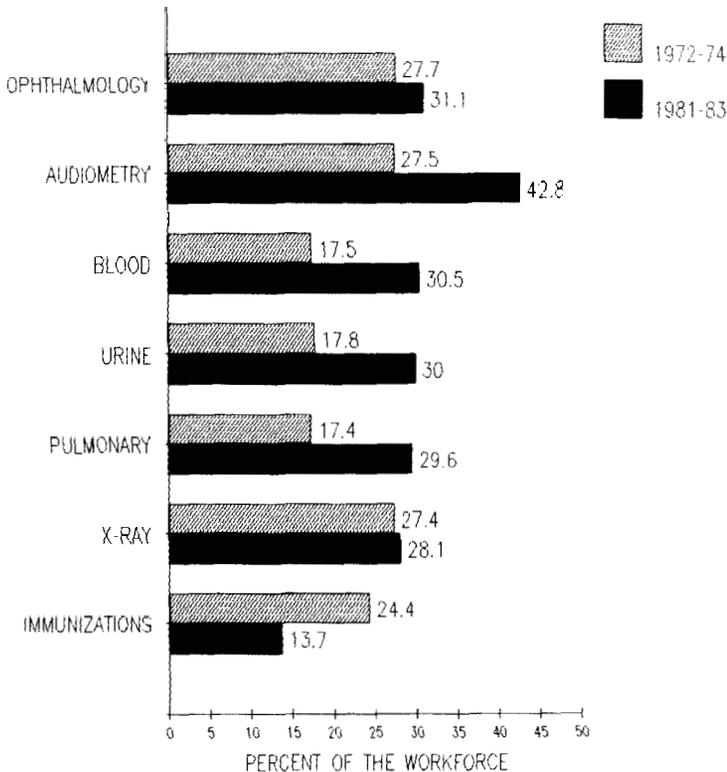


Fig. 6. Workers employed in facilities that provide screening tests to employees.

In the manufacturing sector, measured by estimated proportion of the workforce employed in facilities providing specific screening tests or procedures, increased access to screening tests was noted for five of the seven analyses performed. Decreases were noted in the provision of chest X-rays and immunizations. In the nonmanufacturing sector, increases were noted in six of the seven analyses. The only decrease in provision of tests or procedures was for immunizations. The estimated proportions of the 1974 and 1983 workforces that were provided with each of the seven screening tests or procedures are displayed in Table II.

Required Pre-Employment Examination

The number of all industrial facilities requiring a medical examination of at least some portion of the nonmanagerial workforce prior to hiring or placement showed an estimated 1974 to 1983 increase from about 92,100 to 123,600, which was an increase in the proportion of all facilities from 21.1 to 24.6%. However, the estimated proportion of the workforce employed in such facilities declined from about 55.1% in 1974 to 53.7% in 1983, indicating that much of the increased requirement for pre-employment medical examinations was occurring in facilities that employed relatively fewer workers.

In manufacturing, the estimated proportion of facilities requiring pre-employment examinations increased from about 25.9 to 28.7%, but the proportion of the workforce employed in such facilities declined from approximately 67.1 to 62.3%. The estimated number of manufacturing facilities with such a requirement increased from about 36,500 in 1974 to 54,800 in 1983, and the number of workers in those plants increased from about 10.2 million to approximately 12 million in 1983.

In nonmanufacturing, there was an estimated 1974 to 1983 increase of about 13,000 facilities requiring pre-employment examinations, and the estimated proportion of such facilities remained constant at around 18.6%. The estimated number of workers declined from about 4,271,000 to 3,956,000, resulting in a decrease of the workforce proportion subject to pre-employment examination from around 38.6 to 37.7%.

Recording of Health Information

To "record health information," as defined for both surveys, meant that some standard form was used to record at least a statement on the general health of a worker. More comprehensive record keeping obviously fits within this definition.

TABLE II. Proportion of the 1972-1974 and 1981-1983 Workforce Employed in Facilities Providing Specific Screening Tests or Procedures

Screening test or procedure	Nonmanufacturing		Manufacturing		Total	
	1974	1983	1974	1983	1974	1983
Ophthalmology	20.4	21.8	33.0	36.2	27.7	31.1
Audiometry	17.1	23.6	35.2	53.3	27.5	42.8
Blood	8.6	19.6	24.0	36.4	17.5	30.5
Urine	8.5	20.5	24.6	35.2	17.8	30.0
Pulmonary	8.9	19.0	23.6	35.4	17.4	29.6
X-ray	15.5	16.5	36.0	34.4	27.4	28.1
Immunizations	11.7	7.3	33.7	17.2	24.4	13.7

The estimated proportion of all industrial facilities that record health information on at least some new employees showed a decline from 55.4% in 1974 to 50.2% in 1983, while the estimated number of such facilities increased from approximately 242,200 to 251,800. A similar pattern was noted in the manufacturing sector with a decrease in estimated facility proportion from 61.5 to 56.4%, while estimated facility numbers increased from around 86,900 in 1974 to 108,000 in 1983. This decline in the proportion of facilities recording health information was more severe in the nonmanufacturing sector, where a decrease was noted in both the estimated proportion and number of facilities recording health information. The estimated number of nonmanufacturing facilities recording health data decreased from about 155,200 to 143,900, and the proportion declined from 52.5 to 38.9% during the 1974–1983 period.

The estimated proportion and number of the workforce employed in facilities recording health information followed the same pattern as the facility analysis. In both the manufacturing and total workforce, increases noted in the estimated number of workers were accompanied by a decline in the proportion of the workforce. Manufacturing workers in facilities recording health information increased from an estimated number of 13,330,000 to 15,360,000, but the proportion of the workforce declined from 87.8 to 79.7%. Overall, the estimated number of workers increased from around 20,851,000 in 1974 to 21,426,000 in 1983, but the proportion of the total workforce dropped from 79.4 to 72.0%.

In the nonmanufacturing sector, both the estimated number and proportion of facilities and workers in those plants recording health information decreased. The number of facilities declined from approximately 155,200 to 143,900, and the proportion of facilities decreased from 52.5 to 38.9%. The estimated number of workers employed in nonmanufacturing facilities that record health information on new employees declined from approximately 7,521,000 to 6,076,000, and the proportion of the workforce decreased from 67.9% in 1974 to 57.9% in 1983.

DISCUSSION

The analyses presented in the results section of this paper profile the changes in the provision of selected types of health care that have occurred between 1972–1974 and 1981–1983. An alternate method of examining these changes is to compute the percent change over time in the proportions of facilities (and workers in them) that provide the selected services to at least some of their employees. This could be considered a measure of the “rate of observed change.” Table III presents these data for both facilities and employees by manufacturing and nonmanufacturing sectors and for industry as a whole.

The data in Table III indicate that total worker access to general health care as a result of employment is increasing, although there is a marked change from on-site to off-site provision of such care, and nonmanufacturing industries show a decline. This is most obvious in the case of physician services, where on-site access, measured by proportion of the workforce served, has declined, while off-site provision has increased enormously. In contrast, there are generally substantial increases in the industrial utilization of nurses, first-aid personnel, and other personnel in charge of on-site health units, despite an overall decline in the proportion of the workforce with on-site access to nurses directly employed by industry. Interestingly, these increases

TABLE III. Relative Percent Change in Proportions of Industrial Facilities and Workers in Facilities That Provide Selected Health Services From 1972-1974 (NOHS) to 1981-1983 (NOES)

Analysis	% change in proportion of			Analysis	% change in proportion of		
	Facilities	Employees	Employees		Facilities	Employees	Employees
General health care (on-site)	Mfg.	9.34	.90	Blood tests	Mfg.	112.85	51.69
	Non-mfg.	-12.33	-10.78		Non-mfg.	127.50	128.29
	Total	10.10	2.31		Total	148.89	74.19
Physician (on site)	Mfg.	1.02	-11.93	Urine tests	Mfg.	115.34	43.11
	Non-mfg.	205.00	-32.27		Non-mfg.	175.68	140.89
	Total	55.84	-8.13		Total	182.06	68.46
Physician (off-site)	Mfg.	114.15	189.62	Pulmonary tests	Mfg.	132.77	50.13
	Non-mfg.	112.57	189.75		Non-mfg.	53.72	113.50
	Total	141.20	193.63		Total	105.02	70.29
Nurses	Mfg.	13.44	-5.27	Ophthalmology exam	Mfg.	44.85	9.45
	Non-mfg.	30.95	-34.53		Non-mfg.	5.48	6.67
	Total	34.94	-1.76		Total	30.41	12.20
Trained first aid	Mfg.	9.11	2.93	Audiometric exam	Mfg.	129.84	51.69
	Non-mfg.	-7.73	5.90		Non-mfg.	25.71	38.15
	Total	12.20	7.00		Total	80.49	55.45
On-site health unit	Mfg.	24.37	-.25	X-rays	Mfg.	22.31	47.99
	Non-mfg.	-4.52	-21.41		Non-mfg.	-11.21	6.38
	Total	36.07	4.41		Total	.62	2.63
Health unit with physician in charge	Mfg.	2.06	-17.46	Immunizations	Mfg.	-64.15	-49.16
	Non-mfg.	-8.33	-67.14		Non-mfg.	-50.51	-37.51
	Total	15.00	-19.56		Total	-51.87	-44.00
Health unit with nurse in charge	Mfg.	21.16	19.21	Pre-employment exams	Mfg.	10.78	-7.12
	Non-mfg.	-11.36	6.26		Non-mfg.	-1.12	-2.15
	Total	32.56	27.30		Total	16.94	-2.56
Health unit with other in charge	Mfg.	31.35	6.19	Record health information	Mfg.	-8.29	-9.19
	Non-mfg.	9.18	115.69		Non-mfg.	-25.92	-14.67
	Total	43.27	26.39		Total	-9.35	-9.28
Access to one or more screening tests or immunizations	Mfg.	8.29	5.78				
	Non-mfg.	-15.10	-4.53				
	Total	7.02	7.71				

are primarily found in facility data and are not mirrored in the employee data. This suggests that, to a degree, nonphysician medical personnel are filling a niche in occupational health programs originally reserved for physicians, but are doing so primarily in relatively smaller facilities. This may indicate that larger facilities are rapidly moving toward the use of external sources of medical care in the form of contractual arrangements with medical care providers.

Table III data associated with screening tests, pre-employment examinations, and recording of health information also suggest that significant changes are taking place. General worker access to one or more screening tests or immunizations appears to be increasing slightly overall, although the nonmanufacturing sector again appears to demonstrate decline. The observed increases would be larger except for the effect of the decrease noted for immunizations. Test-specific data show that marked increases (from less than 1% to more than 180% for facilities and from about 2% to more than 74% for employees) are occurring. This information, in conjunction with the data on pre-employment exams and recording of health information, which appear to demonstrate proportional decreases for facilities and employees, again suggests that while worker access to health care is increasing, the delivery mechanism is changing.

Finally, the apparent differences in occupational health care provided by the manufacturing and nonmanufacturing sectors may be of increasing concern. In the analyses presented in both the results section and in the discussion of the percent change in the proportion of plants and workers with access to job-related health care, the nonmanufacturing sector seems to provide some evidence of decline in the provision of occupational health care. This is obviously not true in all the examined areas, but any nonmanufacturing decline in health services must be considered in parallel with the fact that the sector is employing an increasing proportion of the U.S. workforce, as detailed by Personick [1985].

CONCLUSIONS

It appears that while industry as a whole is providing increased worker access to health care, two related events are taking place simultaneously. First, industrial use of on-site physicians is decreasing and the role of the on-site medical practitioner is increasingly being filled by nurses and allied medical personnel. Second, those services that cannot be performed by nonphysicians are apparently being relegated to off-site sources of physicians. This noted increase in the use of off-site contractual medical care may be one of the reasons for the large increases in the use of screening tests and lessened industrial recording of health information, since record keeping and examination functions have been delegated to the contracted physicians.

It is apparent that the traditional roles of occupational health physicians and allied medical personnel are changing rapidly, with unknown effect upon the health of the workforce, especially in the rapidly growing services sector. These changes in the health care delivery system, combining increased access to medical personnel with increasingly off-site delivery of such care, may signal changes in the access of workers to physicians trained in occupational medicine. The nature of these changes and their impact on the quality of medical care for workers should be the subject of further research.

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