

Who Administers? Who Cares? Medical Administrative and Clinical Employment in the United States and Canada

ABSTRACT

Objectives. We compared US and Canadian health administration costs using national medical care employment data for both countries.

Methods. Data from census surveys on hospital, nursing home, and outpatient employment in the United States (1968 to 1993) and Canada (1971 and 1986) were analyzed.

Results. Between 1968 and 1993, US medical care employment grew from 3.976 to 10.308 million full-time equivalents. Administration grew from 0.719 to 2.792 million full-time equivalents, or from 18.1% to 27.1% of the total employment. In 1986, the United States deployed 33 666 health care full-time equivalent personnel per million population, and Canada deployed 31 529. The US excess was all administrative; Canada employed more clinical personnel, especially registered nurses. Between 1971 and 1986, hospital employment per capita grew 29% in the United States (mostly because of administrative growth) and fell 14% in Canada. In 1986, Canadian hospitals still employed more clinical staff per million. Outpatient employment was larger and grew faster in the United States. Per capita nursing home employment was substantially higher in Canada.

Conclusions. If US hospitals and outpatient facilities adopted Canada's staffing patterns, 1 407 000 fewer managers and clerks would be necessary. Despite lower medical spending, Canadians receive slightly more nursing and other clinical care than Americans, as measured by labor inputs. (*Am J Public Health.* 1996;86:172-178)

David U. Himmelstein, MD, James P. Lewontin, and
Steffie Woolhandler, MD, MPH

Introduction

How many Americans does it take to manage a medical care system, nurse the sick, or change a bedpan? How many Canadians?

Estimates of medical administration costs, and potential savings, engender controversy.¹⁻¹⁰ Higher figures bolster the case for single-payer reform, while lower ones imply that such changes would yield meager savings. Previous estimates have relied heavily on accounting categories that often lump clinical with clerical costs (and may vary between nations). An analysis based on workers' descriptions of their actual work bypasses these difficulties. Moreover, the United States and Canada have gathered comparable labor statistics for decades, permitting robust time-trend comparisons of resources devoted to administration, nursing, and other medical care tasks. Finally, since US labor statistics are available far more quickly (within months) than figures on medical care costs, they allow rapid assessment of medical care trends.

Materials and Methods

US Data

We analyzed the US Bureau of the Census March Current Population Survey for each of the 27 years between 1968 (the earliest year available on computer tape) and 1994. The survey involves interviews of members of about 60 000 households representative of the noninstitutionalized population, including about 6000 individuals employed in the health sector. We derived population estimates using the March Current Population Survey final weight, which adjusted for the complex sample design. In keeping with Bureau of

the Census conventions, we do not report confidence intervals. As a rule of thumb, population estimates or differences of less than 75 000 are unreliable.¹¹

Since 1971, the Current Population Survey has categorized health sector workplaces as (1) offices of physicians or other health practitioners, (2) hospitals, (3) nursing/personal care facilities, or (4) other health service facilities (detailed industry codes 812 through 840). Prior to 1971, the survey classified health sector workplaces dichotomously as hospitals or other.

On the basis of the Bureau of the Census Occupational Classification Codes for Detailed Occupational Categories, we grouped the approximately 300 occupations represented in the health sector into 17 categories (Table 1): 3 administrative categories (management and related; administrative support, except financial; and administrative support, financial), 3 nursing categories (registered nurses, licensed practical nurses, and health aides and assistants), 5 other categories of clinical professionals and paraprofessionals (physicians, other health diagnosing [e.g., dentists, podiatrists, optometrists], therapists [e.g., physical, occupational, inhalation], other health professionals [e.g., pharmacists, dieticians], and health technologists and technicians), 3 hotel function categories (food preparation and service; cleaning, building service, and

The authors are with the Center for National Health Program Studies, Department of Medicine, Cambridge Hospital/Harvard Medical School, Cambridge, Mass.

Requests for reprints should be sent to David U. Himmelstein, MD, Division of Social and Community Medicine, The Cambridge Hospital, 1493 Cambridge St, Cambridge, MA 02139.

This paper was accepted July 28, 1995.

TABLE 1—Full-Time Equivalent Medical Personnel (Thousands) in the United States, by Occupation Group: 3-Year Intervals from 1968 through 1992, and 1993

Occupation Group	1968	1971	1974	1977	1980	1983	1986	1989	1992	1993
Managers and related	129	201	266	330	420	484	635	748	977	1 021
Administrative support, except financial	520	645	806	875	1 027	965	1 107	1 254	1 410	1 485
Administrative support, financial	70	57	93	136	189	191	240	265	272	286
Physicians	430	394	484	526	593	670	667	696	776	761
Registered nurses	544	683	750	881	1 105	1 070	1 306	1 397	1 484	1 434
Licensed practical nurses	250	275	339	297	315	333	321	380	389	537
Health aides and assistants	818	969	1 107	1 196	1 361	1 360	1 415	1 479	1 741	1 755
Other health diagnosing (e.g., dentists, podiatrists)	130	150	162	166	183	201	234	250	282	231
Other health professionals (e.g., pharmacists)	31	37	47	73	81	109	115	136	152	135
Therapists (e.g., physical, occupational)	33	79	106	134	183	210	230	198	295	300
Health technologists and technicians	230	278	351	413	525	581	583	663	845	943
Social services	32	51	113	197	180	176	241	256	308	287
Food preparation and service	238	223	288	234	249	244	212	232	197	212
Cleaning, building service, and laundry	264	295	351	353	419	403	397	442	432	409
Building construction and maintenance	91	49	64	78	98	87	86	71	89	128
Professional and technical, except health	46	46	75	64	105	117	124	138	210	287
All other occupations	113	111	149	145	169	181	193	188	215	191
Total	3 976	4 549	5 557	6 106	7 208	7 388	8 116	8 809	10 073	10 308

laundry; and building construction and maintenance), and 3 additional categories (professional and technical, except health; social services; and all other occupations). (Details are available from the authors.)

Between 1968 and 1994, the Bureau of the Census undertook two major and several minor occupation reclassifications.¹²⁻¹⁴ We reconciled the classification schemes by comparing occupation titles and definitions.

We defined one full-time equivalent as 2000 work hours per year, based (since 1976, when the Current Population Survey began collecting these data) on individuals' reports of their hours and weeks worked during the previous calendar year. For earlier years, we analyzed work for the week preceding the March survey, assuming that that week's employment was representative of the full year. We assessed this methodologic change by calculating full-time equivalents for 1975 using both "last week" data from the 1975 Current Population Survey and "last year" data from the 1976 survey; the two estimates were virtually identical.

Canadian Data

Statistics Canada prepared data tapes from a 20% sample of the 1971 and 1986

censuses. Because of the large sample, confidence intervals are narrow.

Occupational classification was based on Statistics Canada's 1971 Standard Occupational Classification codes, which generally correspond to the US occupational codes. In instances in which discrepancies or uncertainties arose, we consulted officials at Statistics Canada and the International Labor Organization's *International Standard Classification of Occupations*. Statistics Canada categorized health sector work sites into the same four groups as the post-1971 Current Population Surveys. However, while the work sites of most nonphysician practitioners were designated practitioners' offices in the United States, 85% of such sites in Canada were classified as other health facilities. Hence, for US/Canada comparisons, we combined these two work-site categories under the rubric "outpatient."

We calculated full-time equivalents from questions about work during the past week. Since Statistics Canada classified work hours as a range (e.g., 20 to 30), we assigned the midpoint of the range (or 52.5 hours to those in the top category, >50 hours per week), multiplied by 52 (weeks) and divided by 2000.

We calculated full-time equivalents per million population using the US and Canadian resident populations for each year as denominators. We calculated employment per hospital bed-day or admission by dividing the total number of hospital labor hours (derived as indicated earlier) by the total number of hospital days (or admissions)¹⁵ (Statistics Canada, unpublished data, 1992).

Results

Health Sector Employees: United States

In 1993, the US health sector employed 11.401 million full- or part-time workers (10.308 million full-time equivalents). In addition, we identified 1.064 million full-time equivalent clinically trained personnel (e.g., nurses, pharmacists) working outside the health sector (e.g., in factories, schools, or drugstores). These non-health sector employees were excluded from all other analyses.

Full-time equivalent medical care employment grew 159% from 1968 to 1993 (Table 1). It rose throughout the 1970s, leveled off briefly during implementation of Medicare diagnostic-related groups in the early 1980s (when employ-

TABLE 2—Full-Time Equivalent Medical Care Workers per Million Population: United States and Canada, 1971 and 1986

	1971		1986	
	Canada	United States	Canada	United States
Managers and related	569	974	1 425	2 634
Administrative support, except financial	3 082	3 123	3 778	4 593
Administrative support, financial	430	280	604	999
Physicians	1 635	1 907	2 051	2 769
Registered nurses	5 467	3 303	6 948	5 419
Licensed practical nurses	1 392	1 334	1 002	1 333
Health aides and assistants	3 569	4 690	2 206	5 872
Other health diagnosing (e.g., dentists)	426	727	669	973
Other health professionals (e.g., pharmacists)	314	180	644	487
Therapists (e.g., physical, occupational)	711	382	1 141	955
Health technologists and technicians	1 455	1 346	1 988	2 423
Social services	463	248	1 294	999
Food preparation and service	1 440	1 079	1 465	882
Cleaning, building service, and laundry	1 932	1 428	1 451	1 649
Building construction and maintenance	361	239	256	358
Professional and technical, except health	841	224	2 148	518
All other occupations	2 478	538	2 458	685
Total	26 565	22 000	31 529	33 666

ment of registered nurses dipped), and then resumed growth.

Employment grew rapidly in the following categories: management and related (692%); administrative support, financial (308%); social services (797%); therapists (786%); and health technologists and technicians (310%). After adjustment for population growth, the number of personnel per million population doubled from 19 943 to 40 264.

Together, administrative occupations (management and related; administrative support, financial; and administrative support, except financial) accounted for 18.1% of medical full-time equivalents in 1968 and 27.1% in 1993. Nursing personnel (registered nurses, licensed practical nurses, and aides) accounted for 40.6% of full-time equivalents in 1968 and 36.3% in 1993; physicians' share also declined (from 10.8% to 7.4%), as did that of hotel-function workers (from 14.9% to 7.3%). Overall, the health sector employed 6.331 million more full-time equivalent personnel in 1993 than in 1968, including 2.072 million additional administrative staff. In 1993, administration accounted for 57% of medical care job

growth and all of the growth in hospital employment.

Between 1971 and 1993, employment increased 82% in hospitals, 188% in nursing homes, 136% in practitioners' offices, and 376% in other medical facilities. In the most recent year, hospitals employed 49% of medical care full-time equivalent personnel; nursing homes, 16%; practitioners' offices, 20%; and other, 15%.

Employment in practitioners' offices (excluding practitioners themselves) grew from 479 000 full-time equivalents (42% of them administrative) in 1971 to 1 459 100 (52% administrative) in 1993. Offices added 550 000 administrative full-time equivalent personnel, almost one per practitioner.

Comparisons with Canada

In 1971, the United States employed 22 000 medical care full-time equivalent personnel per million population; Canada employed 26 565. The occupational mixes of the two medical care work forces were similar (Table 2). For instance, they deployed similar numbers of administrative full-time equivalent personnel per

million (4377 in the United States vs 4082 in Canada) and similar numbers of nursing personnel (9327 vs 10 428).

Between 1971 and 1986, medical care employment rose 53% in the United States and 19% in Canada. In 1986, the United States employed 7% more health sector full-time equivalent personnel per million than Canada, including 2419 extra administrative full-time equivalents per million. The US health sector employed 85% more managers, 22% more nonfinancial administrative support personnel, and 65% more financial administrative support personnel.

When administrative personnel were excluded, the United States actually employed fewer medical full-time equivalent personnel per million than Canada in 1986 (25 440 vs 25 722). The mix of clinical personnel was also different, with Canada employing more registered nurses and fewer licensed practical nurses and technicians. Much of the excess of aides in the United States, and much of the excess in the "other" personnel and "professional and technical, except health" categories in Canada, is concentrated in nursing homes, probably reflecting differences in job titles rather than staffing patterns.

Hospital labor forces. Hospital full-time equivalent personnel per million increased 29% in the United States between 1971 and 1986, largely as a result of an increase in administrative staff, and fell 14% in Canada (Table 3). Hence, the US hospital labor force, smaller per million than Canada's in 1971, was slightly larger by 1986. By 1986, US hospitals employed more administrative staff, social service personnel, technicians, licensed practical nurses, and aides, but Canada employed 27% more registered nurses and somewhat more food service and "other" personnel.

Between 1971 and 1986, the number of (nonphysician) labor hours per hospital day doubled in the United States from 11.8 to 24.8, and fell in Canada from 17.3 to 14.6. However, the US/Canada divergence was modest when tabulated per admission rather than per bed-day. In 1986, a hospital admission entailed 12% more labor hours in the United States than in Canada (227 vs 203), but 22 of the 24 excess hours were administrative. The per admission and per bed-day trends differed because average hospital length of stay in Canada was 2.5 days shorter than in the United States in 1971 but 4.3 days longer in 1986.¹⁶

Nursing home employment. Between 1971 and 1986, nursing home full-time equivalent personnel per million population grew from 4113 to 8850 in Canada and from 2720 to 5236 in the United States (Table 4). Unlike the two nations' hospitals, their nursing homes had similar occupational mixes. In 1986, administrative personnel accounted for 13% of nursing home staff in Canada and 10% in the United States. (These figures are probably comparable, since they exclude the sizable central office staffs of US nursing home chains). Registered nurses and licensed practical nurses accounted for 13% of Canadian nursing home employees vs 14% in the United States.

Outpatient employment. Outpatient employment (excluding practitioners) rose from 3829 to 8134 full-time equivalents per million in the United States and from 2526 to 4570 in Canada (Table 5). Of the 3564 US excess in 1986, administrative staff constituted 44%; aides, 39%; and social service personnel, 8%. The two nations deployed similar numbers of technicians and registered nurses in outpatient settings.

The number of outpatient-based practitioners (physicians, dentists, optometrists, etc.) grew slightly faster in Canada (40% vs 27%), and the number of nonpractitioner, nonadministrative personnel grew similarly (92% in Canada, 97% in the United States). However, administrative staffing grew faster in the United States (136% vs 67%), and its share of total outpatient employment, stable at 29% in Canada, rose from 25% to 33% in the United States.

Discussion

Twenty-seven percent of US medical care workers do mostly paperwork. If the United States duplicated Canada's 1986 staffing patterns, the country's hospitals and outpatient facilities would require 1 407 000 fewer clerks and managers.

These census-based findings match our previous accounting-based estimates.¹⁻³ They also accord with a time/motion study conducted in Rhode Island¹⁷: 24% of hospital jobs were purely administrative; primary care physicians spent 9% of their time on insurance forms (and another 17% charting and dictating); and, in a surgeon's practice, 678 minutes per day were spent on billing and 348 minutes on charting, filing, and seeking information. Similarly, in New York hospitals, 26.3% of personnel were administrative.¹⁸ In Pennsylvania hospitals, adminis-

TABLE 3—Full-Time Equivalent Nonphysician Hospital Employees per Million Population: United States and Canada, 1971 and 1986

	1971		1986	
	Canada	United States	Canada	United States
Managers and related	337	408	607	1 191
Administrative support, except financial	1 778	1 845	1 856	2 525
Administrative support, financial	235	167	252	510
Registered nurses	4 831	2 528	5 506	4 328
Licensed practical nurses	1 193	964	724	840
Health aides and assistants	2 708	2 940	1 032	1 809
Other health diagnosing (e.g., dentists)	39	0	66	0
Other health professionals (e.g., pharmacists)	279	135	508	292
Therapists (e.g., physical, occupational)	540	247	520	656
Health technologists and technicians	886	878	968	1 359
Social services	302	133	229	446
Food preparation and service	1 093	739	831	546
Cleaning, building service, and laundry	1 528	1 043	938	951
Building construction and maintenance	331	216	206	290
Professional and technical, except health	298	140	421	362
All other occupations	1 535	367	808	466
Total	17 913	12 823	15 472	16 568

TABLE 4—Full-Time Equivalent Nursing Home Employees per Million Population: United States and Canada, 1971 and 1986

	1971		1986	
	Canada	United States	Canada	United States
Managers and administrative support ^a	589	402	1181	506
Registered nurses	262	167	904	408
Licensed practical nurses	165	180	245	347
Health aides and assistants	785	1095	1121	2609
Therapists (e.g., physical, occupational)	97	14	387	47
Social services	144	51	953	168
Physicians and other health professionals (not included above) ^b	18	46	54	106
Food, cleaning, maintenance ^c	730	671	1131	927
All other occupations ^d	1322	94	2875	117
Total	4113	2720	8851	5235

Note. Columns may not sum to total because of rounding.

^aIncludes the categories managers and related; administrative support, except financial; and administrative support, financial.

^bIncludes the categories other health diagnosing, other health professionals, and health technologists and technicians.

^cIncludes the categories food preparation and service; cleaning, building service, and laundry; and building construction and maintenance.

^dIncludes the categories professional and technical, except health and all other occupations.

TABLE 5—Full-Time Equivalent Outpatient Employees per Million Population: United States and Canada, 1971 and 1986

	1971		1986	
	Canada	United States	Canada	United States
Managers and administrative support ^a	1143	1480	1911	3493
Registered nurses	373	608	539	683
Licensed practical nurses	34	189	33	146
Health aides and assistants	76	655	52	1454
Other health professionals (e.g., pharmacists)	31	13	116	110
Therapists (e.g., physical, occupational)	74	122	234	252
Health technologists and technicians	562	461	1004	1060
Social services	17	64	112	385
Food, cleaning, maintenance ^b	51	76	67	176
All other occupations ^c	165	161	502	375
Total (excluding practitioners)	2524	3830	4572	8135
Practitioners	1481	2045	2073	2605

Note. Columns may not sum to total because of rounding.

^aIncludes the categories managers and related; administrative support, except financial; and administrative support, financial.

^bIncludes the categories food preparation and service; cleaning, building service, and laundry; and building construction and maintenance.

^cIncludes the categories professional and technical, except health and all other occupations.

trative spending increased twice as fast as other costs between 1983 and 1990.¹⁹

Our figures understate US administration. We excluded the quarter million people who work for US health insurance companies,²⁰ as well as tens of thousands who work in corporate health benefits departments and at corporate headquarters of hospital and nursing home chains. Few are employed in such settings in Canada, where government health insurance bureaucracy is also spare.¹³ We classified all social workers as clinical, although some of those responsible for the large US surfeit work on reimbursement.

Several caveats apply. Occupation is self-reported in the Current Population Survey, but errors should be small for jobs with clear titles (e.g., registered nurses, accountants). Moreover, our post-1980 figures match those from government surveys of employers²⁰⁻²² and limited figures derived from American Hospital Association data (D. U. Himmelstein, J. P. Lewontin, and S. Woolhandler, unpublished data, 1980, 1986, 1990). We could not analyze off-site workers doing food preparation, laundry, or administration (e.g., billing services) for medical providers. Such services are more com-

monly contracted out in the United States than in Canada.

Minor errors in our US/Canada comparisons may also arise from differences in work-site and job classifications. The Canadian census defined nursing home aides more narrowly, leaving more nursing home workers in our "other" and "professional and technical, except health" categories. But few Canadian administrative personnel are likely to have been misclassified in these categories since an inclusive list of clerical, financial, and managerial job titles was used to construct our administrative categories. Because the Canadian census data do not detail hours for those working more than 50 hours per week, it understates physician full-time equivalents, which are similar to those of the United States.¹⁶ While our latest detailed Canadian data are for 1986, more recent, gross figures show persistence of the patterns we observed.²³⁻²⁵ For instance, hospital employment per capita in 1991/92 was within 0.5% of the 1986 figure,²⁶ while nurse employment was about 5% higher.^{27,28} Hence, the administrative work force cannot have expanded much.

Our data and those of other recent studies help explain how Canada's medi-

cal care system costs 40% less per capita than that of the United States and provides comparable incomes to medical personnel,²⁹⁻³¹ yet delivers more care.^{16,32-34} Canadian hospitals employ slightly more caregivers—and a higher skill mix of nurses—but many fewer clerks and administrators. In addition, nonlabor hospital costs are lower in Canada^{35,36} as a result of tighter control of capital spending (as reflected in its employment of 18% fewer technicians) as well as lower spending for corporate providers' profits and executive compensation.³⁷ Canadian nursing homes employ more of all types of personnel. Relative to those of the United States, Canada's outpatient facilities deploy similar numbers of practitioners, nurses, and technicians but many fewer administrative personnel and aides.³⁸

Although Canada's hospitals began the transition to single-payer financing in the 1950s, the program's implementation was not completed until 1971. That year, Canadian and US hospitals employed similar complements of administrative staff, although administration accounted for a greater share of the smaller hospital work force in the United States. Since then, administrative employment has soared in US hospitals and risen modestly in Canadian ones. Most of the US administrative surplus in outpatient facilities has also emerged since 1971.

The US/Canada divergence—and the low administrative costs reported for globally budgeted hospitals in the United Kingdom,³⁹ Sweden,⁴⁰ France,¹⁸ and the United States (Shriner's hospitals)⁴¹—implicates the fragmentation of multi-payer systems as one cause of high administrative costs. Only in nursing homes were similar proportions of staff devoted to administration in the United States and Canada, mirroring similarities in reimbursement. In both countries, almost all nursing home payments come from a single public payer (Medicaid in the United States) or directly from patients and families.

Yet fragmentation per se cannot explain the sharp increase in US administrative staffing since 1968 or the modest upward drift in Canadian hospitals. Canada's increase, and a fraction of the US change, may reflect an appropriate response to the increasing complexity and demands for accountability of hospitals, or merely a shared tendency of entrenched bureaucracies to proliferate. But the steepness of the US upswing implicates a uniquely American ingredient.

Administration's growth spurt, especially brisk in the last year, has coincided with promarket policies in the United States designed by managed care's architects to make providers' profitability "the mandatory condition for survival."⁴² Entrepreneurial incentives spur marketing, detailed cost tracking, and efforts to amplify profitable services, eliminate unprofitable ones, and battle insurers over payment. Despite recent hopeful claims of cost containment, labor force data show continued rapid expansion of medical employment through February 1995.⁴³ Notably, market-based reforms in Britain have sharply increased previously spare administration, and medical costs have risen.⁴⁴

Recent US policies have also assigned more regulatory power to insurance firms and employers. From their vantage point outside the clinic, these corporate overseers have sought to change care through increasingly rigorous inspection. This frightens and burdens many physicians⁴⁵ and may raise patients' suspicion that insurers' and employers' interests are given primacy. To many policy experts, however, such external audit is the obvious means to prevent overuse, improve quality, stimulate efficiency, and hold down costs.^{9,46,47} Whether harmful or helpful, this managerial strategy demands from hospitals and physicians an ever more detailed paper replica reproducing each clinical encounter in shadow form before, as, and after it takes place in physical form.⁴⁸

Other strategies forgo external inspection of each detail of care but hold providers accountable for more aggregate results and empower those doing the work to devise improvements. Global budgetary cost controls in Canada, continuous quality improvement,⁴⁹ and the oversight of academic research are examples of this managerial approach.

Curiously, we have exempted new administrative procedures from the evaluation we demand of clinical ones. Does managerial pressure to compress care save work or just accelerate the pace? Do managed care referral constraints husband scarce resources or merely keep clerks busy and specialists idle? Does more administration increase efficiency or waste time and trees? □

Acknowledgment

This research was supported by the Robert Wood Johnson Foundation (grant 18170).

References

1. Woolhandler S, Himmelstein DU. The deteriorating administrative efficiency of the U.S. health care system. *N Engl J Med*. 1991;324:1253-1258.
2. Woolhandler S, Himmelstein DU, Lewontin JP. Administrative costs in U.S. hospitals. *N Engl J Med*. 1993;329:400-403.
3. Himmelstein DU, Woolhandler S. Cost without benefit: administrative waste in U.S. health care. *N Engl J Med*. 1986;314:441-445.
4. *Canadian Health Insurance: Lessons for the United States*. Washington, DC: US General Accounting Office; 1991.
5. *Universal Health Insurance Coverage Using Medicare's Payment Rates*. Washington, DC: Congress of the United States, Congressional Budget Office; 1991.
6. *Administrative Costs Statement*. Washington, DC: Health Insurance Association of America; 1991.
7. Sheils JF, Young GJ, Rubin RJ. O Canada: Do we expect too much from its health system? *Health Aff*. 1992;11:7-20.
8. Schwartz WB, Mendelson DN. Eliminating waste and inefficiency can do little to contain costs. *Health Aff*. 1994;13:224-238.
9. Thorpe KE. Inside the black box of administrative costs. *Health Aff*. 1992;11:41-55.
10. Himmelstein DU, Woolhandler S. Bias in, bias out: a reply to Sheils, Young and Rubin. *Health Aff*. 1992;11:235-238. Letter.
11. *Current Population Survey, March 1993 Technical Documentation*. Washington, DC: US Bureau of the Census; 1993.
12. Priebe JA, Heinkel J, Greene S. *1970 Occupation and Industry Classification Systems in Terms of their 1960 Occupation and Industry Elements*. Washington, DC: US Bureau of the Census; 1972. Technical Paper 26.
13. Priebe JA, Vines PL. *The Relationship between the 1970 and 1980 Industry and Occupation Classification Systems*. Washington, DC: US Bureau of the Census; 1989. Technical Paper 59.
14. *1970-1980 Occupation Classification: CPS-Based 1970 Sort*. Washington, DC: US Bureau of the Census; 1984.
15. *Hospital Statistics*. Chicago, Ill: American Hospital Association; 1992.
16. *Organization for Economic Cooperation and Development Computer Database of Health Statistics*. Paris, France: Organization for Economic Cooperation and Development; 1993.
17. *Directions for Elder Care in Rhode Island*. Providence, RI: Aging 2000; 1991.
18. Rodwin VG, Brecher C. HHC and AP: system-wide comparisons. In: Rodwin VG, Brecher C, Jolly D, Baxter RJ, eds. *Public Hospital Systems in New York and Paris*. New York, NY: New York University Press; 1992.
19. Shulkin DJ, Hillman AL, Cooper WM. Reasons for increasing administrative costs in hospitals. *Ann Intern Med*. 1993;119:74-78.
20. Hiles DRH. Health services: the real jobs machine. *Monthly Labor Rev*. November 1992;3-16.
21. Hilsenrath PE, Levey S, Weil TP, Ludke R. Health services management manpower and education: outlook for the future. *J Health Administration Educ*. 1993;11:407-419.
22. Anderson K, Wootton B. Changes in hospital staffing patterns. *Monthly Labor Rev*. March 1991;3-9.
23. Statistics Canada. *Hospital Annual Statistics, 1989-90; Part 4—Personnel*. Ottawa, Ontario, Canada: Canadian Center for Health Information; 1993.
24. Weil TP, Miller WH. *An Alternative in Health Care Reform: The Facts on the Canadian Health System*. Phoenix, Ariz: Silver & Cherner; 1993.
25. Weil TP, Stack MC. Health reform—its potential impact on hospital nursing service. *Nurs Economics*. 1993;11:200-207.
26. Hospital statistics, preliminary annual report 1991-92. *Health Rep*. 1993;5:250.
27. *Nursing in Canada 1992: Registered Nurses*. Ottawa, Ontario, Canada: Statistics Canada; 1993. Publication 83-243.
28. Paton S, Lobin T. Nursing in Canada—1991. *Health Rep*. 1992;4:321-324.
29. Miller RH. Containing use and expenditures in publicly insured long-term care programs. *Health Care Financing Rev*. 1993;14:181-207.
30. Haber SG, Zwanziger J, Anderson JG, Thorpe KE, Newhouse JP. Hospital expenditures in the United States and Canada: do hospital worker wages explain the differences? *J Health Econ*. 1992;11:453-465.
31. Detsky AS, Stacey SR, Bombardier C. The effectiveness of a regulatory strategy in containing hospital costs: the Ontario experience, 1967-81. *N Engl J Med*. 1983;309:151-159.
32. Fuchs VR, Hahn JS. How does Canada do it? A comparison of expenditures for physician services in the United States and Canada. *N Engl J Med*. 1990;323:884-890.
33. Weil TP. Clinton's health reform and emergency department volumes: a return visit. *Ann Emerg Med*. 1993;22:852-854.
34. *Bone Marrow Transplantation: International Comparisons of Availability and Appropriateness of Use*. Washington, DC: General Accounting Office; 1994.
35. *Hospital Indicators 1988-89: Volume 4—Total Expenses*. Ottawa, Ontario, Canada: Statistics Canada; 1992.
36. Donham CS, Maple BT, Letsch SW. Health care indicators. *Health Care Financing Rev*. 1993;14:209-237.
37. Nemes J. HCA execs pocket millions with stock option payouts. *Modern Healthcare*. March 29, 1993;3.
38. Berry C, Brewster JA, Held PJ, Kehrer BH, Manheim LM, Reinhardt U. *A Study of the Responses of Canadian Physicians to the Introduction of Universal Medical Care Insurance: the First 5 Years in Quebec*. Princeton, NJ: Mathematica Policy Research; 1978.
39. Chew R. *Compendium of Health Statistics*. 8th ed. London, England: Office of Health Economics; 1992.
40. *Statistisk Årsbok För Landsting 1990/91*. Stockholm, Sweden: Landstingsförbundet; 1991.
41. Lutz S. Free for all. Shriners, Scottish Rite

- children's hospitals expect their mission to continue under reform. *Modern Healthcare*. September 20, 1993:34-36.
42. Ellwood PM, Anderson NN, Billings JE, Carlson RJ, Hoagberg EJ, McClure W. Health maintenance strategy. *Med Care*. 1971;9:291-298.
43. Employees on nonfarm payrolls by detailed industry. *Employment Earnings*. 1995;42: 65-76.
44. Robinson R, LeGrand J, eds. *Evaluating the NHS Reforms*. London, England: Kings Fund Institute; 1994.
45. Berwick DM. Improving the appropriateness of care. *Quality Connection*. 1994;3: 1-6.
46. Zelman WA. The rationale behind the Clinton health reform plan. *Health Aff*. 1994;13:9-29.
47. Blumenthal D. Administrative issues in health care reform. *N Engl J Med*. 1993;329: 428-429.
48. Braverman H. *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century*. New York, NY: Monthly Review Press; 1974.
49. Berwick DM, Godfrey AB, Roessner J. *Curing Health Care: New Strategies for Quality Improvement*. San Francisco, Calif: Jossey-Bass; 1990.