Health care industries and the New York City labor market

From 1990 to 1995, New York City's health care employment rose faster than the national average, but growth then slowed until 2002, when the pace quickened again; the 1995–2002 slowdown reflected slower growth in hospital care expenditures, while accelerated job growth after 2002 reflected strong growth in the elderly population and in home health care

Martin Kohli

In the United States, employment in the health care industries has grown more rapidly than total nonfarm employment.[1] From 1990 through 2008, for instance, annual average total employment increased by 25.2 percent, while in health care the percent change was an even more robust 58.3 percent.

In New York City, the same pattern has held: total employment rose by 6.4 percent over the same 18-year period, while health care employment expanded by 41.5 percent. Moreover, because industries other than health care have grown much more slowly in New York City than in the rest of the country, health care industries accounted for 52.1 percent of the 226,600 jobs gained during those years. As chart 1 shows, total employment in all industries combined, other than health care, declined relative to 1990 in 14 of the next 18 years. (For the purposes of this article, health care consists of three private-sector industries—ambulatory care (NAICS 621), hospitals (622), and nursing and residential care facilities (623)—and State government hospitals.[2] This breakdown includes all private-sector employment in health care industries. Current employment data for Federal and local government hospitals in New York City are not available. An appendix discusses the sources and concepts of the labor market information used in this article.)

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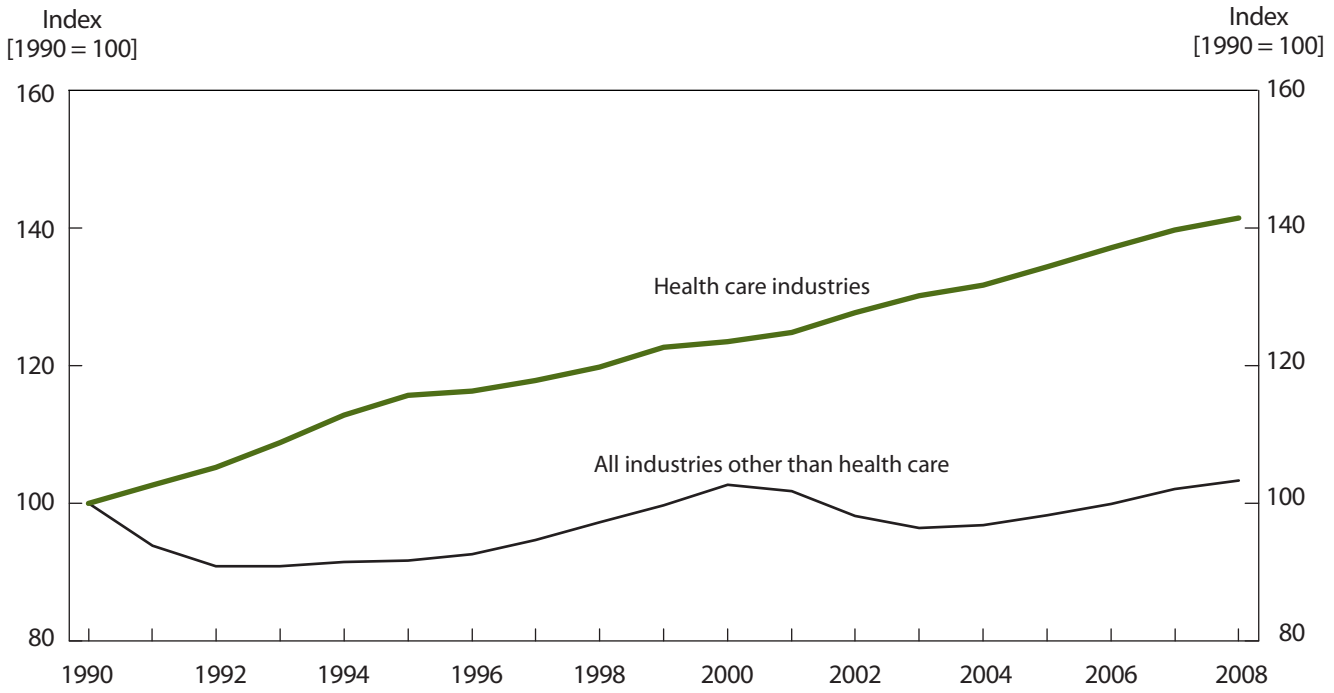
Health care employment growth

Although health care employment has grown at a robust rate in New York City and the Nation, the pace has varied over time. From 1990 through 1995, employment in New York City's health care industries increased by at least 2.0 percent per year. Over the next 6 years, however, health care employment growth crossed that threshold only once. In 2002 employment growth rebounded, and in 4 of the years of the 2002–08 period growth again reached 2.0 percent. As chart 2 illustrates, employment growth in the national industry group followed the same pattern of decelerating in the later 1990s and then accelerating during the first half of the next decade.[3] As table 1 shows, over the entire 18-year period the average annual rate of employment change in the health care industries in New York City, 1.8 percent, although impressive, was lower than the national rate of 2.4 percent. But over the 1990–95 subperiod, the figures were closer: 3.0 percent in New York City and 3.3 percent in the Nation. Over the next 7 years, the gap widened, with health care employment in New York City increasing by an average of 1.4 percent per year while the national increases were 2.0 percent.

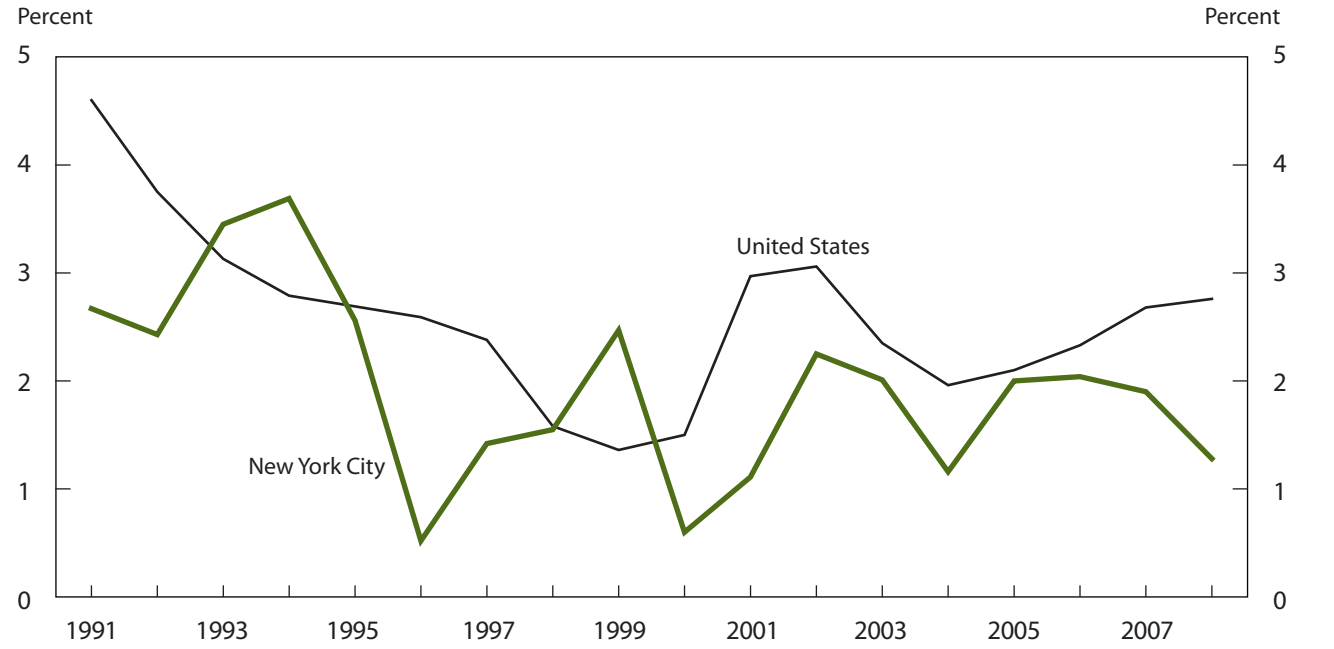
This article explores how health care industries in New York City first came close

Chart 1. **Indexes of annual average employment, health care industries and all industries other than health care, New York City, 1990–2008**



SOURCE: Bureau of Labor Statistics, Current Employment Statistics survey.

Chart 2. **Over-the-year change in annual average employment, health care industries, United States and New York City, 1990–2008**



NOTE: For each year shown, this over-the-year change is from the previous year to the year shown. That is, for 1991, the over-the-year change is from 1990 to 1991; for 1992, the over-the-year change is from 1991 to 1992; and so on.

SOURCE: Bureau of Labor Statistics, Current Employment Statistics Survey.

to matching the national pace of employment growth and then lagged behind. The starting point of the analysis is the fact that the aggregate of health care industries includes detailed industries that face different patterns of demand growth and different constraints in the labor market. The primary analytical question is whether New York City's slower growth in health care employment in the years after 1995 was a result of the mix of health care industries in the City, slower growth within detailed industries, or a combination of the two. Other studies of regional economies have used similar decompositions of employment growth.[4]

To be more specific about the issue of industry composition, consider that in 1990 private hospitals accounted for the largest share of industry employment nationally, 40.7 percent, followed by ambulatory care. (See chart 3.) Private hospitals also were the largest health care employer in New York City, but the employment share in the City was 9.7 percentage points higher than it was nationally. In the mid- and late 1990s, a number of initiatives, discussed later, aimed to slow the rate of growth of spending on hospital care. To the extent that these initiatives diminished the growth of hospital employment, industry composition could account for the sharper deceleration in New York City in 1996 and later years.

Before the aforementioned decomposition is presented, the next section considers factors influencing the growth of industry revenues in the years after 1990. Some of

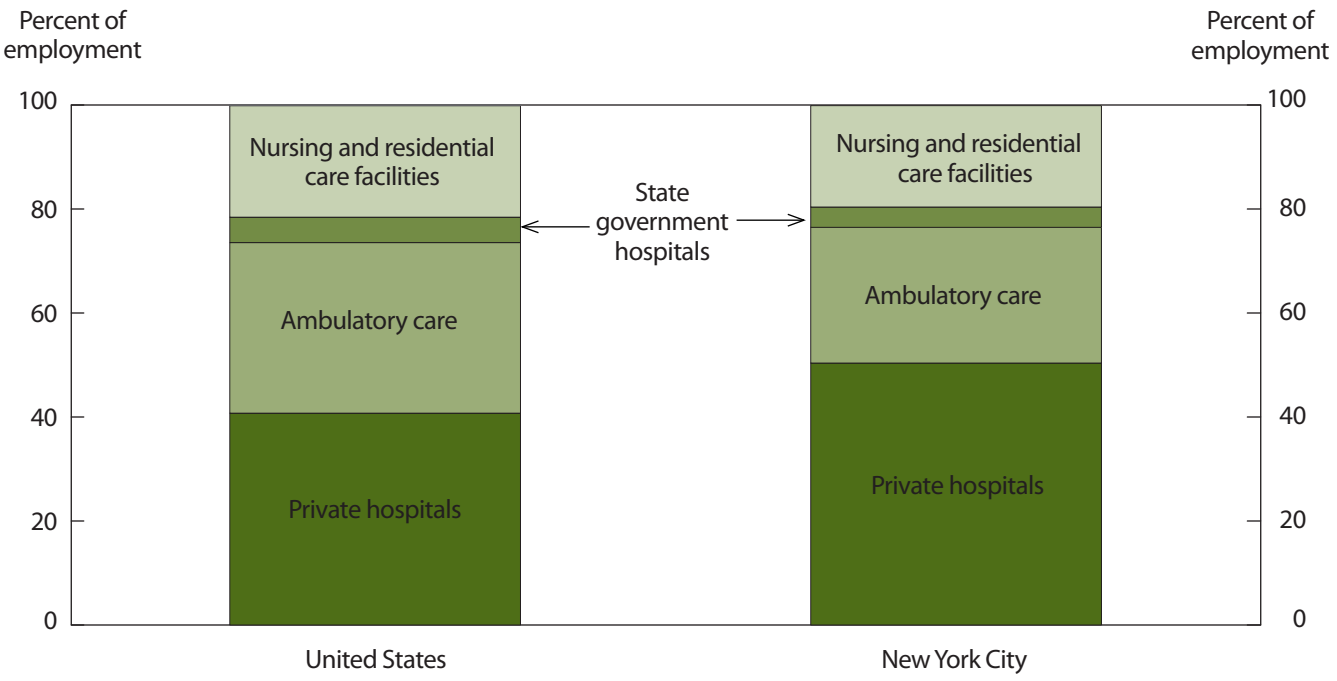
Table 1. Employment in health care industries, United States and New York, 1990 and 2008

[Numbers in thousands]

Area	Employment		Change		Average annual rate of change (percent)
	1990	2008	Number	Percent	
United States	8,636.8	13,673.3	5,036.5	58.3	2.4
New York State	717.1	977.5	260.4	36.3	1.6
New York City	284.2	402.2	118.0	41.5	1.8
Balance of New York State	432.9	575.3	142.4	32.9	1.4

NOTE: The health care industries include ambulatory health care services, hospitals, and nursing and residential care facilities (NAICS 621–623) in the private sector and in State government hospitals.
SOURCE: Bureau of Labor Statistics, Current Employment Statistics survey.

Chart 3. Employment shares within health care industries, United States and New York City,1990



SOURCE: Bureau of Labor Statistics, Current Employment Statistics survey.

these factors, such as the growth of the elderly population, influenced the growth of all health care industries, while other factors—namely, initiatives aimed at limiting the growth of spending for in-patient hospital care—were focused on particular industries within health care. A review of the factors influencing revenue growth, along with a brief review of labor market developments, will provide a context for interpreting the results of the decomposition.

Factors influencing industry revenue growth

Money matters! One of the earlier mentioned studies of health care employment found that when funding was expanded or curtailed, employment trends changed.[5] The most comprehensive information on health care spending, from the Centers for Medicare and Medicaid Services, is available for States, but not for cities. One of the issues this section explores is whether spending has expanded relatively more rapidly in the Nation or in New York State. Because health care spending tends to vary with the size of the population (as well as with other factors), the section begins by considering population growth in the Nation and in New York, the latter at both the State and sub-State levels.

Population growth. The population of the United States increased by 52 million between 1990 and 2007, an average of 1.1 percent a year.[6] (See table 2.) The rate of change declined slightly over this period. From 1990 through 1995, the average rate of growth of the population was 1.3 percent per year. In the late 1990s and the early 2000s, the rate of growth eased downwards, but remained at or above 0.9 percent, as chart 4 illustrates.

New York State's population expanded by 1.3 million from 1990 through 2007, a rate of 0.4 percent a year, less than the national rate. New York City's population grew by an average of 0.8 percent a year—less than the average growth rate for the Nation, but 4 times the average rate for the rest of New York State. Moreover, for all three subperiods examined (1990–95, 1995–2002, and 2002–07), the rate of change in the Nation exceeded the rate for New York City, which in turn exceeded the rest of the State's rate. (The years 1995 and 2002 were selected as midpoints because, as discussed earlier, health care employment growth decelerated beginning in 1995 and then accelerated starting in 2002.)

The aging of the population also contributes to the growth of health care industry revenues. Because of Medicare, the portion of the population without health insurance is lower for those older than 65 years than for the population as a whole.[7] Because aging often leads to multiple medical problems, the elderly are more intense users of certain medical services. The elderly who are no longer able to take care of themselves are the primary customers of the nursing home and home health care industries. As a result of their greater access to insurance and their higher rates of utilization, medical spending for those older than 65 has tended to be at least twice as high as the average for all age groups.[8] Thus, if New York City's elderly population had grown rapidly, that growth would be a possible explanation for the relatively strong employment growth of the City's health care industries during either the 1990–95 period or the 2002–08 period.

Nationally, the number of people aged 65 years and older increased by 6.6 million from 1990 through 2007,

Table 2. Resident population, all ages and 65 years and older, United States and New York, selected years, 1990–2007

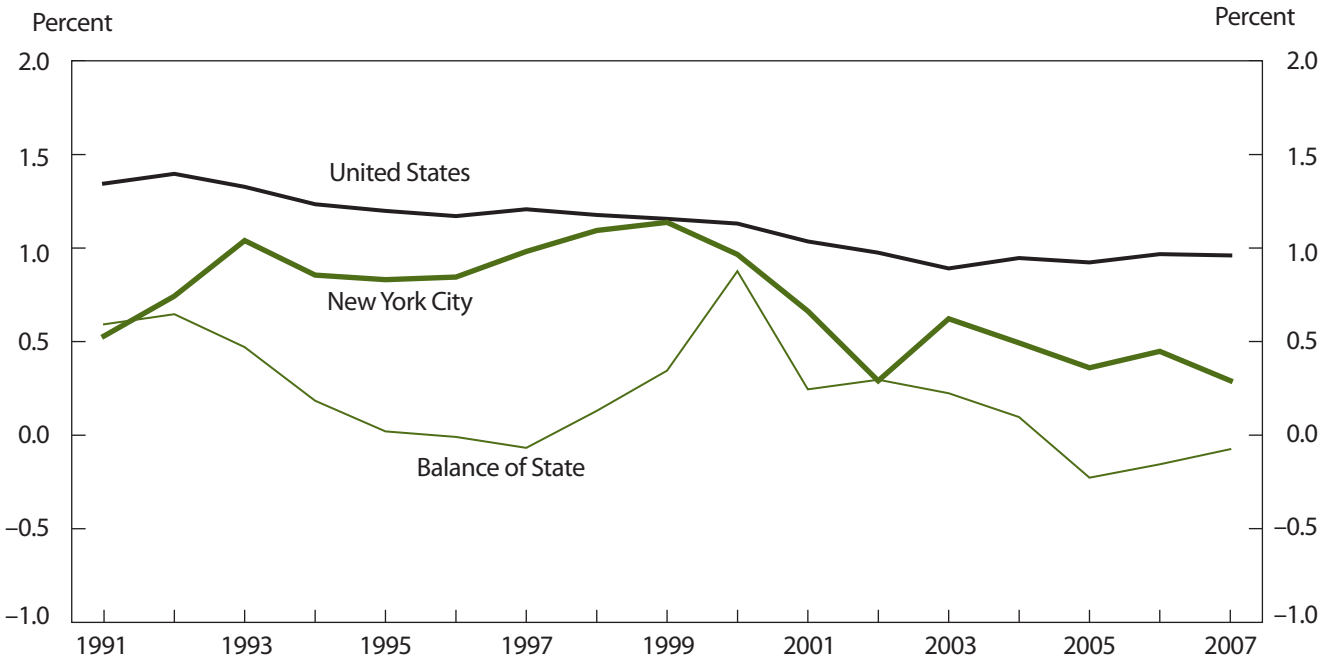
[Numbers in thousands]

Area and age group	Population				Average annual rate of change (percent)			
	1990	1995	2002	2007	1990–2007	1990–95	1995–2002	2002–07
All ages								
United States	249,623	266,278	287,888	301,621	1.1	1.3	1.1	0.9
New York State	17,964	18,467	19,133	19,298	.4	.6	.6	.2
New York City	7,329	7,627	8,094	8,275	.8	.8	.9	.4
Balance of New York State	10,635	10,840	11,039	11,023	.2	.4	.3	–.1
65 years and older								
United States	31,247	33,769	35,588	37,888	1.0	1.5	.7	1.2
New York State	2,336	2,398	2,474	2,546	.5	.5	.5	.6
New York City	936	921	959	1,013	.5	–.3	.7	1.1
Balance of New York State	1,400	1,478	1,515	1,533	.4	1.1	.4	.2

NOTE: Data pertain to July 1 of each year. Rates of change were calculated with unrounded figures.

SOURCE: U.S. Census Bureau.

Chart 4. Over-the-year changes in population, all ages, United States, New York City, and balance of New York State, 1990–2007



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SOURCE: U.S. Census Bureau.

an average of 1.0 percent a year. During 1990–95, changes were at or above 1.3 percent per year, somewhat higher than the growth rate of the general population. The rate of change dipped toward the end of the decade and then rose again, reaching 1.7 percent in 2007.

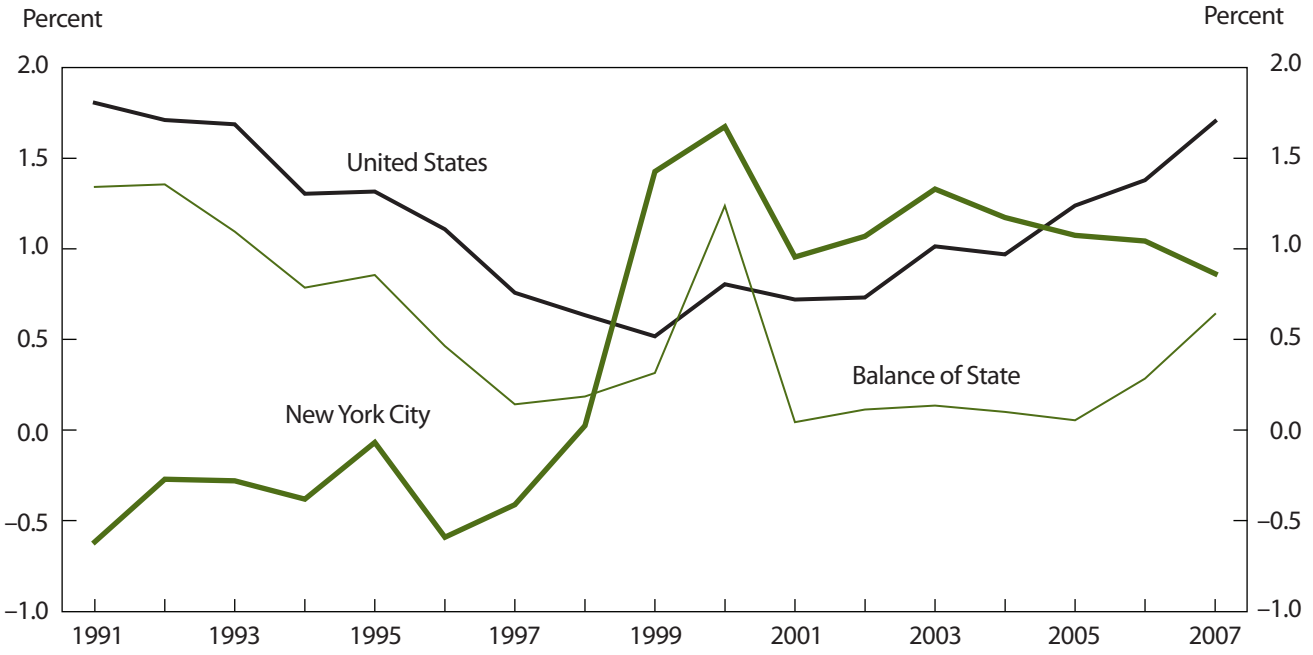
The number of people aged 65 years and older in New York State increased by 0.2 million over the 18-year period studied. The balance of the State had a larger numeric increase than the City did. The difference between the two areas was sharpest during the period 1990–95, when the number of elderly in New York City shrank. The losses ended in 1998. It follows that changes in the elderly population could not have contributed to the expansion of the City's health care industry during the 1990–95 period. Starting in 1999 and continuing through 2007, the number of elderly in New York City increased by at least 0.9 percent per year. From 1999 to 2004, the City's percentage increase exceeded the Nation's. (See chart 5.) These figures suggest that spending for the elderly might have contributed to the strong expansion of the City's health care industry during the 2002–08 period.

Personal health care spending and initiatives to control it. Information on health care spending, as measured by the Centers for Medicare and Medicaid Services, is for States, but not for cities. At the State level, the Centers track spending on personal health care expenses (hospital care, professional services, nursing home and home health, and retail outlet sales—mostly for pharmaceuticals). Because population is a real (as opposed to a nominal) variable, the figures in table 3 reflect changes in spending, adjusted for changes in prices.[9]

Table 3 indicates how the growth of health care spending reflected demographic trends as well as other factors. Given the Nation's higher rates of population growth, it is not surprising that personal health care expenditures grew more rapidly in the United States than in New York State over the whole 1990–2004 period.

The years 1990–95, however, saw a larger rate of spending growth in New York State (1.5 percent per year) than in the Nation (0.9 percent). This difference was not due to either of the major public-sector programs: the average increases in New York State's Medicare and Medicaid spending were 0.3 percentage point and 1.5 percentage points smaller, respectively, than the national rates of growth over the subperiod. Over the next 7 years, however, national personal health care expenditures increased by an average of 0.8 percentage point per year more than New York State's expenditures. In the final subperiod shown in table 3, spending increased by an average of roughly 3

Chart 5. Over-the-year changes in population 65 years and older, United States, New York City, and balance of New York State, 1990–2007



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SOURCE: U.S. Census Bureau.

Table 3. Real personal health care expenditures, United States and New York State, selected years, 1990–2004

[Billions of December 1986 dollars]

Area and source	Expenditures					Average annual rate of change (percent)			
	1990	1995	2002	2004	2006	1990–2004	1990–95	1995–2002	2002–04
United States, all sources	$452.3	$475.8	$562.0	$596.5	$627.6	2.0	0.9	2.4	3.0
Medicare	78.4	95.5	102.2	109.2	129.5	2.1	4.1	.5	3.4
Medicaid	50.7	71.6	91.6	98.3	95.5	4.1	6.7	3.6	3.6
New York State, all sources	35.7	38.3	43.3	46.0	—	1.7	1.5	1.6	3.1
Medicare	6.1	7.2	7.5	7.9	—	1.8	3.8	.1	2.5
Medicaid	8.4	11.1	13.4	13.8	—	3.0	5.2	2.3	1.7

NOTE: Medicaid amounts include Federal, State, and local dollars. Dashes indicate data not available. The most recent State-level data extend only to 2004. Components of personal health care expenditures were deflated with the use of the Consumer Price Indexes for hospital and related services, professional services, prescription drugs, nonprescription drugs, and medical services and the Producer Price Index for home health care services. All of these indexes refer to the United States. December 1986 was used as a base because the Consumer Price Index for nonprescription drugs began in that month. Rates of change were calculated from unrounded expenditures.

SOURCE: Current-dollar expenditures are from the Centers for Medicare and Medicaid Services, Office of the Actuary.

percent a year in both the Nation and New York State.

Real spending by the two major Government programs did not adhere to the same patterns over time as did spending from all sources. In the first half of the 1990s, spending for Medicare and Medicaid was expanding more rapidly than spending from all sources in both the Nation and the State. After 1995, however, spending growth for both programs decelerated. Part of the slowdown in Medicare can be attributed to slower growth in the number of people eligible for the program. As noted earlier, from 1990 through 1995 the number of people aged 65 years or older in the Nation increased by at least 1.3 percent a year, while in the late 1990s and the first part of the new decade the yearly increases were 1.0 percent or less.

The Balanced Budget Act of 1997 also contributed to the deceleration in Medicare spending. The Act reduced reimbursement rates for hospitals and established managed care alternatives to fee-for-service Medicare plans and new payment systems for home health services.[10] In current dollars, Medicare spending on personal health care inched up 0.7 percent between 1997 and 1999, but spending for hospitals was little changed (0.1 percent), while expenditures for home health care plummeted 40.9 percent.[11] In real terms, national Medicare spending on personal health care fell 5.4 percent between 1997 and 1999. Also, in 1997 Medicare began a demonstration project with 41 teaching hospitals, most of them in New York City, intended to reduce the program's future payments for graduate medical education.[12]

Medicare spending grew more slowly in New York State than in the Nation during all three subperiods. In part, this slower growth reflected that of the elderly population in the State.

The Balanced Budget Refinement Act, passed in November 1999, ameliorated the effects of the Balanced Budget Act. The later Act provided hospitals with additional funds for graduate medical education and reduced the cuts in Medicare payments to hospitals with a disproportionate share of indigent patients. The Act also postponed scheduled reductions in payments for home health care, while it increased payments to nursing homes for very sick patients.[13] The Medicare Prescription Drug, Improvement, and Modernization Act of 2003 raised payments for managed care plans and rural providers in 2004.[14] In part because of this Act, real Medicare expenditures increased 4.8 percent from 2003 to 2004.

Medicaid spending for the Nation displayed a similar pattern of slowing in the mid-1990s and then accelerating after 1998. Katharine Levit and her colleagues attributed the deceleration of nominal spending to a rise in managed care penetration, which went from 9.5 percent of Medicaid enrollment in fiscal year 1991 to 47.8 percent in fiscal year 1997. Also, the number of Medicaid enrollees dropped slightly in 1995 and 1996 and more markedly in 1997.[15] In 1999, however, enrollment in the State Children's Health Insurance Program (SCHIP) more than doubled.[16] SCHIP was a State-Federal program that allowed States to cover eligible children either through State-specific expansions or through expansions of existing Medicaid programs. Outreach efforts by State governments resulted in continued increases in enrollment in SCHIP and other Medicaid programs in the first years of the next decade.[17]

Several other developments influenced spending in New York State. In 1997, the State passed its Health Care Reform Act, which ended a system of price regulation for State hospitals. At the time, occupancy rates were falling as the effects of the AIDS and other epidemics subsided.[18] Although the deregulation of hospital rates was intended to encourage competition, some observers maintain that it helped trigger a round of mergers and consolidations in New York City that resulted in four networks of hospitals, centered around teaching hospitals and their medical schools.[19] At the State level, Medicaid spending on personal health care fell 2.5 percent in real terms between 1996 and 1997, the only decline between 1990 and 2003. For hospitals in New York State, the decline in real Medicaid spending was even sharper: a 7.8-percent drop between 1996 and 1997.

Figures from the New York State Department of Health show how different regions of the State were affected by changes in Medicaid spending. In both New York City and the rest of the State, Medicaid spending rose from 1990 until 1996. From 1996 to 1997, spending fell sharply in real terms. As chart 6 shows, New York City and the balance of the State experienced declines of similar magnitudes: 7.5 percent and 8.5 percent, respectively. Relatively slow spending growth characterized 1999 and 2000, but Medicaid spending expanded by between 4 percent and 9 percent a year in both the City and the rest of the State from 2001 through 2003.

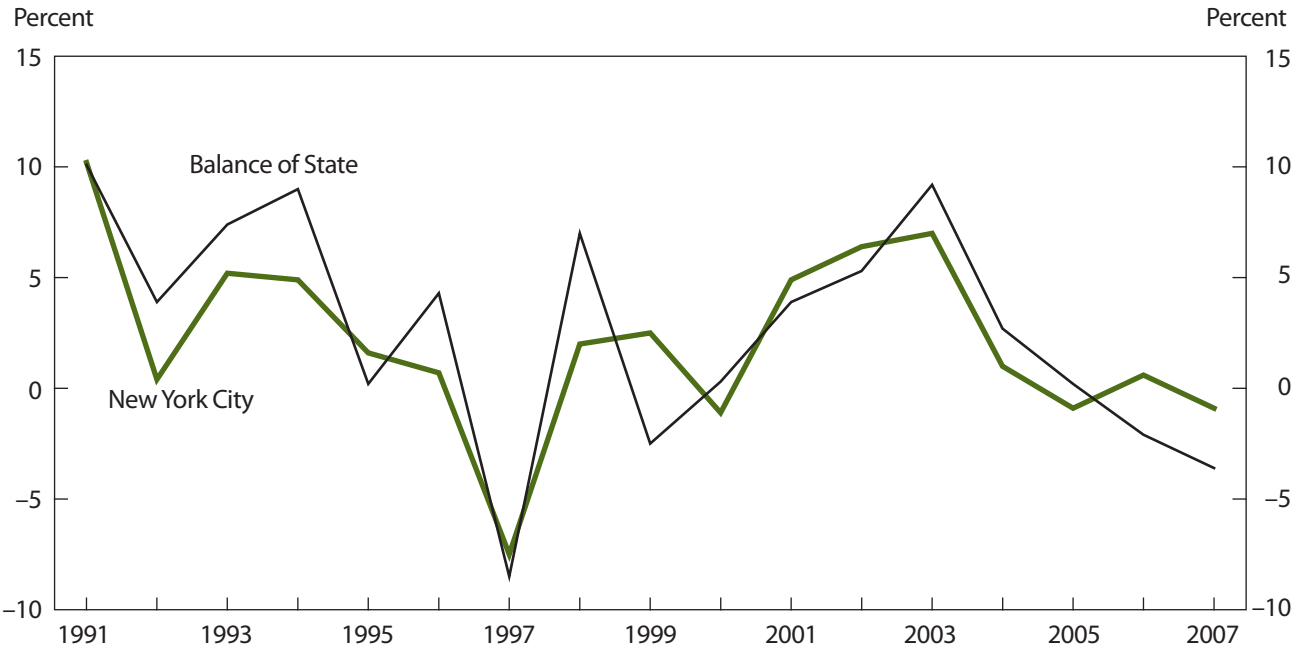
Occupational employment and education

Changes in health care spending are one influence on the demand for those who work in health care industries. A second set of influences reflects the specific skills and educational requirements of different industries within health care. Although certain occupations, such as registered nurse, are employed in significant numbers throughout the health care industries, other occupations tend to be concentrated within one of the detailed industries. Thus, supplies (or the lack) of different types of labor can help (or hinder) the expansion of particular health care industries.

Table 4 presents employment and annual wages for occupations with 1,000 or more jobs in health care industries in New York City in May 2007; the table's totals reflect all occupations, including those with fewer than 1,000 jobs. The self-employed were excluded. The table also identifies, for each occupation, the level of education or training generally required or attained by people in that occupation.[20]

More than 25,400 jobs (or 6.8 percent of employment) required a first professional degree; 16,010 of these were physicians and surgeons, all other (Standard Occupational

Chart 6. Over-the-year changes in real medicaid expenditures, New York City and balance of New York 1990–2007



NOTE: For each year shown, the over-the-year change is from the previous year to the year shown. That is, for 1991, the over-the-year change is from 1990 to 1991; for 1992, the over-the-year change is from 1991 to 1992; and so on.

SOURCES: Nominal data on expenditures are from the New York State Department of Health; the Consumer Price Index for medical services in northeast urban areas, used to deflate expenditures, is from the Bureau of Labor Statistics.

Classification code 29–1069), who are among the most educated workers. An additional 114,960 jobs required an associate's or higher degree; 49,100 of these jobs were as registered nurses, the most common occupation in the health care industries in New York City. Seventy percent of these nurses were in private hospitals, while 19 percent worked in ambulatory care and 8 percent in nursing homes. Within private hospitals, registered nurse was the detailed occupation with the most employment.

Another 12.8 percent of employment generally required postsecondary vocational awards; within this category, nursing aides, orderlies, and attendants, as well as licensed practical and licensed vocational nurses, with 31,040 and 10,010 jobs, respectively, accounted for large shares of employment. Approximately half of the nursing aides worked in the nursing home industry, where they were the detailed occupation with the greatest employment.

Finally, 110,560 jobs (or 29.4 percent of industry employment) required only short-term on-the-job training; of these jobs, 37,720 were as home health aides, the second most common occupation in the large industry group and the most common occupation in ambulatory care. Two clerical occupations—receptionists and information clerks, and general office clerks—together accounted for another 22,850 jobs within the educational category of short-term on-the-job training.

Given the diversity of educational requirements, it is not surprising that these health care jobs pay at a variety of different wage and salary levels. More than 35,000 jobs (9.3 percent of employment) had a mean annual salary above $100,000; of the occupations with more than 1,000 jobs, family and general practitioners, general dentists, and physicians and surgeons were among the highest paid. An additional 84,810 jobs had an average wage exceeding New York City's average of $54,140. Home health aides, with an average of $18,421, were the lowest paid workers.

New York City labor market developments

The demand by health care industries for workers with specific educational credentials is only one factor in New York's City's large and dynamic labor market. The supply of labor—reflecting the growth of the population and decisions about education and participation—also matters. In addition to seeking certain skills, a number of managers in health care industries are concerned with the

Table 4. Employment, mean annual wage, and educational requirements, by occupation, in health care industries in New York City, May 2007

Occupation	Employment[1]	Mean annual wage	Most significant source of postsecondary education or training[2]
Total, all occupations	376,130	$52,222	—
Management occupations	16,780	103,404	—
General and operations managers	1,830	113,627	Bachelor's or higher degree, plus work
Administrative services managers	1,110	92,203	Bachelor's or higher degree, plus work
Medical and health services managers	6,920	104,645	Bachelor's or higher degree, plus work
Social and community service managers	1,270	70,077	Bachelor's degree
Business and financial operations occupations	5,080	55,262	—
Computer and mathematical science occupations	1,390	65,802	—
Life, physical, and social science occupations	2,330	85,118	—
Clinical, counseling, and school psychologists	1,350	88,528	Doctoral degree
Community and social services occupations	18,320	42,829	—
Substance abuse and behavioral disorder counselors	2,120	41,010	Bachelor's degree
Mental health counselors	1,970	35,795	Master's degree
Rehabilitation counselors	2,660	29,463	Master's degree
Medical and public health social workers	2,810	58,431	Bachelor's degree
Mental health and substance abuse social workers	1,720	43,721	Master's degree
Social workers, all other	1,760	54,119	Bachelor's degree
Social and human service assistants	2,110	33,540	Moderate-term on-the-job training
Education, training, and library occupations	1,310	74,987	—
Healthcare practitioners and technical occupations	123,320	82,161	—
Dentists, general	2,630	131,622	First professional degree
Dietitians and nutritionists	1,240	55,717	Bachelor's degree
Pharmacists	1,290	89,631	First professional degree
Family and general practitioners	1,060	141,523	First professional degree
Psychiatrists	1,410	124,380	First professional degree
Physicians and surgeons, all other	16,010	129,069	First professional degree
Physician assistants	2,350	81,833	Master's degree
Registered nurses	49,100	80,986	Associate's degree
Physical therapists	3,320	75,641	Master's degree
Respiratory therapists	1,610	62,625	Associate's degree
Medical and clinical laboratory technologists	3,660	56,079	Bachelor's degree
Medical and clinical laboratory technicians	2,130	42,458	Associate's degree
Dental hygienists	1,560	69,960	Associate's degree
Diagnostic medical sonographers	1,480	60,736	Associate's degree
Radiologic technologists and technicians	3,600	63,507	Associate's degree
Emergency medical technicians and paramedics	2,910	43,985	Postsecondary vocational award
Surgical technologists	1,410	44,204	Postsecondary vocational award
Licensed practical and licensed vocational nurses	10,010	45,285	Postsecondary vocational award
Medical records and health information technicians	2,330	37,486	Associate's degree
Health technologists and technicians, all other	1,020	46,696	Postsecondary vocational award
Health care support occupations	90,330	26,747	—
Home health aides	37,720	18,421	Short-term on-the-job training
Nursing aides, orderlies, and attendants	31,040	32,444	Postsecondary vocational award
Psychiatric aides	1,650	32,843	Short-term on-the-job training
Dental assistants	5,310	32,368	Moderate-term on-the-job training
Medical assistants	6,680	29,763	Moderate-term on-the-job training
Health care support workers, all other	4,020	34,144	Short-term on-the-job training
Protective service occupations	3,580	34,538	—
Security guards	3,270	33,632	Short-term on-the-job training
Food preparation and serving-related occupations	9,090	30,838	—
Cooks, institution and cafeteria	1,240	33,721	Moderate-term on-the-job training
Food preparation workers	3,900	30,535	Short-term on-the-job training
Food servers, nonrestaurant	1,830	29,463	Short-term on-the-job training

See footnotes at end of table.

Table 4. Continued—Employment, mean annual wage, and educational requirements, by occupation, in health care industries in New York City, May 2007

Occupation	Employment[1]	Mean annual wage	Most significant source of postsecondary education or training[2]
Building and grounds cleaning and maintenance occupations	11,570	$30,495	—
Janitors and cleaners, except maids and housekeeping cleaners	4,380	29,183	Short-term on-the-job training
Maids and housekeeping cleaners	5,790	30,221	Short-term on-the-job training
Personal care and service occupations	12,800	22,529	—
Childcare workers	1,850	24,013	Short-term on-the-job training
Personal and home care aides	8,820	19,374	Short-term on-the-job training
Recreation workers	1,110	29,559	Short-term on-the-job training
Office and administrative support occupations	71,420	35,386	—
First-line supervisors/managers of office and administrative support workers	8,690	50,948	Work experience in a related occupation
Billing and posting clerks and machine operators	3,410	35,285	Moderate-term on-the-job training
Bookkeeping, accounting, and auditing clerks	3,120	35,755	Moderate-term on-the-job training
File clerks	1,470	25,943	Short-term on-the-job training
Interviewers, except eligibility and loan	1,730	35,911	Short-term on-the-job training
Receptionists and information clerks	12,400	28,245	Short-term on-the-job training
Stock clerks and order fillers	1,120	33,750	Short-term on-the-job training
Executive secretaries and administrative assistants	3,940	43,295	Work experience in a related occupation
Medical secretaries	2,370	36,001	Moderate-term on-the-job training
Secretaries, except legal, medical, and executive	13,970	34,414	Moderate-term on-the-job training
Office clerks, general	10,450	30,655	Short-term on-the-job training
Office and administrative support workers, all other	1,420	37,606	Short-term on-the-job training
Installation, maintenance, and repair occupations	3,260	43,273	—
Maintenance and repair workers, general	2,210	39,188	Moderate-term on-the-job training
Production occupations	1,730	40,248	—
Transportation and material-moving occupations	1,360	30,478	—

[1] Estimates for detailed occupations do not sum to totals because the totals include occupations not shown separately. Only occupations with employment of 1,000 or more are shown. Estimates do not include self-employed workers.

[2] A detailed occupation is placed into 1 of 11 categories that best describes the postsecondary education or training needed by most workers to become fully qualified in that occupation. For more information about the categories, see *Occupational Projections and Training Data*, 2008–09 edition, Bulletin 2701 (Bureau of Labor Statistics, January 2008). Because major occupational groups contain detailed occupations with a variety of educational sources, no source is shown for higher levels of aggregation.

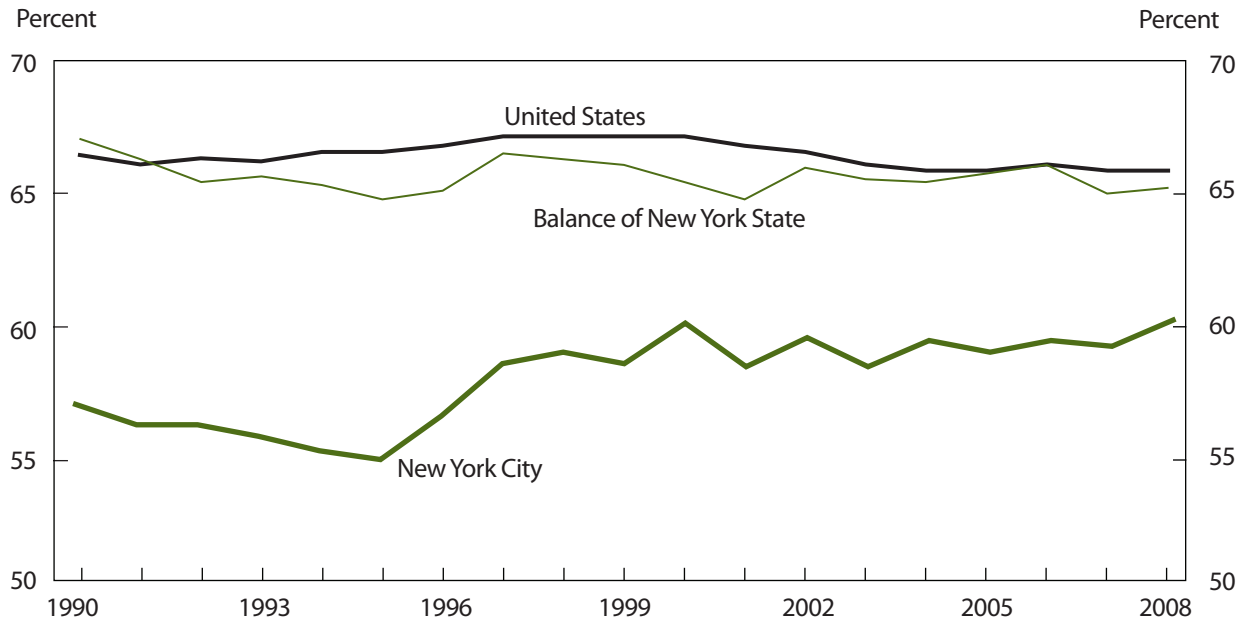
SOURCES: Employment and wages are based on data provided by the New York State Department of Labor for ambulatory health care services, hospitals, and nursing and residential care facilities (NAICS 621–623) in the private sector and in State government hospitals. The classification of occupations by significant source of education was developed by the Bureau of Labor Statistics.

racial and ethnic diversity of the health care workforce. A recent report linked the issue of labor force diversity to the need to provide "culturally and linguistically appropriate care for New York's populations."[21]

Labor market constraints and opportunities. Historically, New York City has had a labor force participation rate below that of the Nation. In 1990, for example, 66.5 percent of the national population 16 years and older was either employed or unemployed, while in New York City the figure was 57.1 percent. (See chart 7.) In 1996, however, the Federal Government ended the Aid to Families with Dependent Children program, replacing it with Temporary Assistance to Needy Families, a program that imposed work requirements on participants and rewarded States for moving welfare recipients, often single mothers, into the labor force. In New York City, the labor force participation rate began rebounding in 1996 and reached 59.9 percent in 2000. (The participation rate for women in New York City, which had been 47.1 percent in 1995, stood at 52.4 percent in 2000.)

In 1997, as chart 4 indicates, the pace of population growth in New York City picked up. The combination of a growing population and a rising participation rate resulted

Chart 7. Labor force participation rates, United States, New York City, and balance of New York State, 1990–2008



SOURCE: Bureau of Labor Statistics, Current Population Survey.

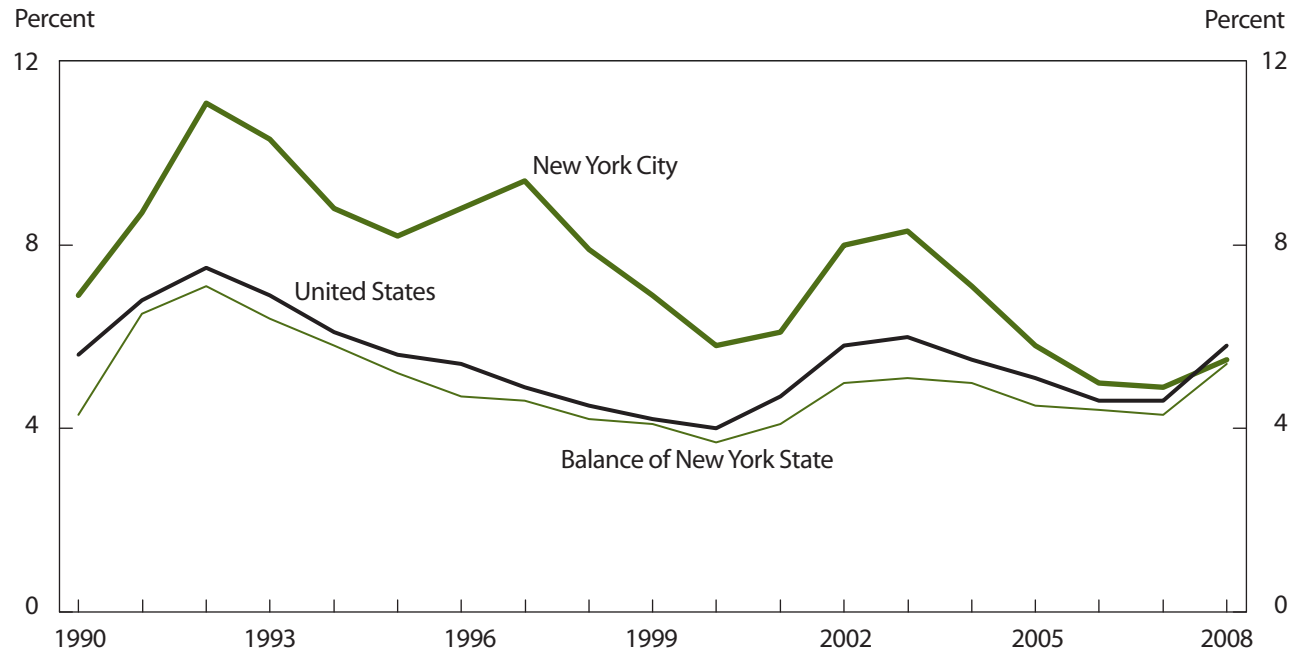
in large increases in the City's labor force. In 1996 the City's labor force expanded by 96,000, and in 1997 it grew by an additional 139,000. These were the two largest over-the-year increases in the 32 years for which the BLS has published the current labor force series. One study of the effects of welfare reform found that the influx of single mothers accounted for 14 percent of the growth in New York City's labor force over the period from 1996 through 1999.[22] As the study noted, many of these women had low levels of educational attainment.

This labor force expansion was particularly opportune for the home health care industry. As noted earlier, in 1999 and later years New York City's elderly population was growing by at least 0.9 percent per year, increasing the demand for home health care services. Between 2001 and 2003, employment in the City's home health care industry jumped from 32,900 to 40,300, an increase of 22.5 percent. The growth of this industry required hiring large numbers of nurses and home health aides, the latter being the dominant occupation in the industry. As table 4 illustrates, home health aides need only short-term on-the-job training. The City's labor force was in fact able to supply the required numbers of both health care professionals and aides who lacked significant educational and training credentials. In 2001, approximately 478,000 members of New York City's labor force older than 25 years (16.2 percent of the labor force over age 25) had less than a high school degree; the comparable national figure was 10.4 percent.[23]

The unprecedented expansion of New York City's labor force was accompanied by a rise in the unemployment rate from 8.2 percent in 1995 to 9.4 percent in 1997, as chart 8 illustrates. But after the recession in 2001 and the slow recovery, which stretched into 2003 and 2004, the City's unemployment rate drifted down and closer to the national average. In 2007, the City's rate reached 4.9 percent, its lowest annual average in the history of the unemployment rate series. In the balance of New York State, the unemployment rate was 5.0 percent or less from 2004 through 2007.

The low unemployment rates in the years 2004 through 2007 posed a challenge for human resource professionals in New York's health care industries. Unlike the situation in the late 1990s, health care spending was expanding at robust rates, particularly for the care of the elderly population. Unlike the situation in the early 1990s, the labor market was tight in both New York City and the balance of the State. A number of studies have called attention to the shortage of registered nurses and other health care occupations. For example, a survey of hospitals in New

Chart 8. Unemployment rates, United States, New York City, and balance of New York State, 1990–2008



SOURCE: Bureau of Labor Statistics, Local Area Unemployment Statistics.

York City, Long Island, and the Hudson Valley by the Center for Health Workforce Studies reported difficulties recruiting pharmacists, experienced registered nurses, nuclear medicine technologists, and physical therapists.[24] One study of the City's nursing crisis also pointed out that nursing schools, like health care providers, were struggling to recruit and retain skilled nurses.[25]

The shortages of health care professionals reflect multiple factors, including constraints on the supply side of the labor market.[26] The number of people aged 20–24 years in the New York City labor force—the cohort that provides many entry-level workers—was almost unchanged over the 1995–2005 period.[27] Educational requirements represent additional constraints. The number of people graduating as registered nurses in New York City declined from 7,685 in 1996 to 5,128 in 2002, before rising again. In 2006, the last year for which data are available, the number of registered-nurse graduations stood at 7,772, only slightly above the 1996 level.[28] Indeed, in part because of the relatively slow growth of the domestic supply of nurses, the health care industry, both nationally and in New York City, has recruited nurses from overseas.[29]

Labor force diversity. Like other industries, health care industries in New York City operate in a labor market that, historically, has differed from national averages in many respects. In 1990, for example, 26.1 percent and 20.0 percent of the City's labor force were Black and Hispanic, respectively. Nationally, the figures were lower: 10.9 percent and 8.5 percent, respectively.

Table 5 presents selected demographic characteristics of employees in health care industries. (Because of the small sizes of annual samples in New York City, the table uses 3-year averages.) Note that, in all three periods presented in the table, the vast majority of City residents who worked in health care were women. Not surprisingly, given that the labor force in New York City has higher-than-national concentrations of Blacks and Hispanics, so does the health care industry in the City. Reflecting New York City's traditional role as a port of entry, more than half of the health care workforce was foreign born during both the 2000–02 and 2006–08 periods.

Chart 9 illustrates the different patterns of immigration for workers in New York City. Roughly half of all employed residents of the City were native born during the 2006–08 period. Of the foreign born, 13 percent came from countries in the Caribbean, while 12 percent came from Asia, 11 percent from Central and South America, and 8 percent from Europe. In the health care industries, the native born accounted for 42.0 percent of workers. Thus, health care appears to be more reliant on foreign-born workers than are industries in general. In health care,

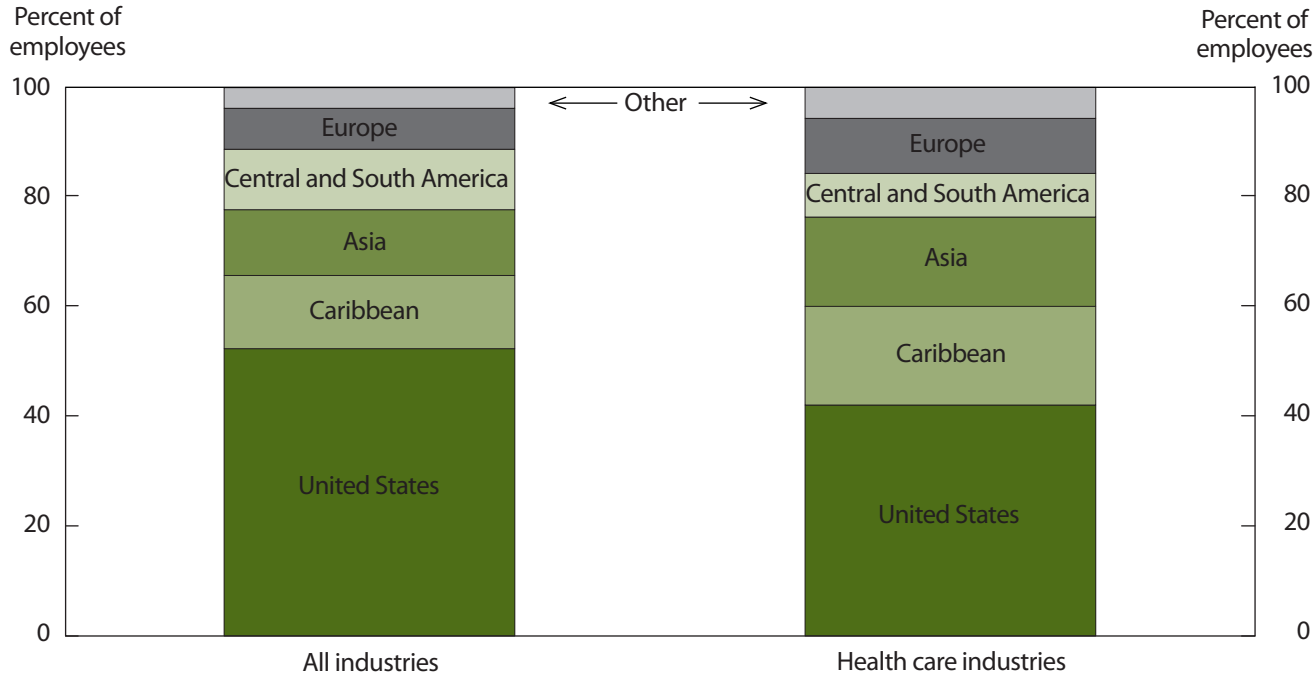
Table 5. Demographic characteristics of employees in health care industries, United States and New York City, selected periods, 1990–2008

Characteristic	Percent of employees in health care industries					
	1990–92		2000–02		2006–08	
	United States	New York City	United States	New York City	United States	New York City
All employees in health care	100.0	100.0	100.0	100.0	100.0	100.0
Women	75.0	72.0	78.6	75.5	77.7	73.4
Black or African American	13.2	39.8	16.2	42.8	15.7	40.3
Hispanic or Latino ethnicity	5.9	17.0	7.6	19.7	9.2	24.0
Foreign-born	—	—	12.9	53.6	15.4	58.0

NOTE: Persons whose ethnicity is identified as Hispanic or Latino can be of any race. Beginning in 2003, the methods for classifying race and industry changed, so data for the 2006–08 period are not strictly comparable to data for earilier periods. Dash indicates datum not available.

SOURCE: Current Population Survey.

Chart 9. Distribution by geographic region of nativity of New York City residents empoyed in all industries and in health care industries, 2006–08 average



NOTE: The U. S. share includes people born in Puerto Rico and other outlying areas.

SOURCE: Bureau of Labor Statistics, Current Population Survey.

moreover, the share of workers from the Caribbean was almost one-fifth, with the share from Central and South America about 1 in 12. The distribution of registered nurses (not shown in the chart because of the small sample size) exhibited some similarities to that of health care workers in general, such as a high share from the Caribbean and a smaller share from Central and South America. This finding was consistent with that of another study which estimated that 3.8 percent of registered nurses in New York City were Hispanic.[30]

Differences in employment growth rates

Table 1 shows that, over the period 1990–2008, health care employment in the Nation grew more strongly than in New York City (an average of 2.4 percent per year, compared with 1.8 percent), while the City's employment growth rate outpaced that of the balance of New York State (1.4 percent). Table 6 shows the average annual rates of growth and the shares of employment of detailed industries within health care. The table presents data for the

three-digit industries mentioned earlier (ambulatory care, hospitals, and nursing and residential care facilities), along with the four-digit industries within ambulatory care that are available for both the Nation and the City.

Nationally, employment in ambulatory care almost doubled over the 18-year period examined; the average annual increase of 3.6 percent was the largest among the three-digit industries. Nursing and residential care facilities ranked second in employment growth among these industries, followed by private hospitals, while employment in State government hospitals contracted. Within ambulatory care, the four-digit industries shown in table 6 all had robust rates of job growth. Home health care services had the largest average annual growth rate (5.4 percent), followed by outpatient care centers (3.9 percent). Although these two industries experienced rapid rates of employment growth, their shares of health care employment were at or below 3.3 percent in 1990, and together they accounted for fewer than 1 out of every 5 jobs that the national health care industry added over the 1990–2008 period.

New York City had a similar pattern of growth across industries. At the three-digit level, ambulatory care had the strongest average annual growth rate (4.3 percent), and State government hospitals shed employment. (The rate of contraction in State government hospitals, 3.3 percent, was sharper than the 1.1-percent national contraction rate.) Within ambulatory care, home health care services and outpatient care centers ranked first and second in employment growth (with rates of 7.1 percent and 3.5 percent, respectively), just as they did nationally.

New York City's health care industries had almost matched national job growth from 1990 to 1995 and then lagged behind. To understand this pattern better, it is useful to decompose the differences in employment growth by detailed industry. For any point in time, t, employment in the U.S. health care industry can be written as the sum of employment in seven of the eight detailed industries shown in table 6:

$$(1) \qquad E_t^{US} = \Sigma E_{t\ i}^{US} = E_{t\ 1}^{US} + E_{t\ 2}^{US} + \ldots + E_{t\ 7}^{US}.$$

The detailed industries are the four components of ambulatory care shown in the table, plus the other three-digit industries. The annual rate of growth of employment over the period of T years is the number g^{US} such that

$$(2) \qquad E_T^{US} = E_0^{US}(1 + g^{US})^T,$$

where E_0^{US} is U.S. health care industry employment at the start of the period. Now, let $t = T$ in equation (1), divide by $\Sigma E_{0\ i}^{US}$, and rearrange terms. Then employment growth over the period of T years can be expressed as a weighted sum of terms involving rates of employment growth in the detailed industries:

$$(3) \qquad (1 + g^{US})^T = s_{0\ 1}^{US}(1 + g_1^{US})^T + s_{0\ 2}^{US}(1 + g_2^{US})^T + \ldots + s_{0\ 7}^{US}(1 + g_7^{US})^T,$$

where $s_{0\ i}^{US}$ is industry i's share of health care employment

Table 6. Shares of industry employment and average annual rates of employment change in health care industries, United States and New York City, 1990–2008

(Percents)

Industry (ownership)	NAICS	United States		New York City	
		Share of employment, 1990	Average annual rate of change, 1990–2008	Share of employment, 1990	Average annual rate of change, 1990–2008
Health care industries	None	100.0	2.4	100.0	1.8
Ambulatory health care services	621	32.9	3.6	26.1	4.3
Offices of physicians	6211	14.8	3.2	9.6	3.4
Outpatient care centers	6214	3.0	3.9	3.2	3.5
Home health care services	6216	3.3	5.4	5.5	7.1
Other ambulatory health care	6212, 6213, 6215, and 6219	11.8	3.4	7.8	2.9
Hospitals, private	622	40.7	1.4	50.4	.3
Nursing and residential care facilities	623	21.5	2.6	19.6	1.9
Hospitals, State government	622	4.9	–1.1	3.9	–3.3

SOURCE: Bureau of Labor Statistics, Current Employment Statistics Survey.

at $t = 0$, the start of the period. Similarly, for New York City,

$$(4) \quad (1 + g^{NYC})^T = s_0{}^{NYC}{}_1(1 + g^{NYC}{}_1)^T + s_0{}^{NYC}{}_2(1 + g^{NYC}{}_2)^T + \ldots + s_0{}^{NYC}{}_7(1 + g^{NYC}{}_7)^T.$$

Subtracting the New York City equation from the national equation yields the following expression for the difference:

$$(5) \quad (1 + g^{US})^T - (1 + g^{NYC})^T = \Sigma s^{US}{}_i[(1 + g^{US}{}_i)^T - (1 + g^{NYC}{}_i)^T] + \Sigma(s^{US}{}_i - s^{NYC}{}_i)(1 + g^{NYC}{}_i)^T.$$

A first-order approximation of the difference in annual growth rates, $g^{US} - g^{NYC}$, can be obtained by expanding the terms in $(1 + g)^T$, subtracting the higher order powers of g^{US} and g^{NYC} from both sides, and dividing by T, the length of the period:

$$(6) \quad g^{US} - g^{NYC} = (1/T)\{\Sigma s^{US}{}_i[(1 + g^{US}{}_i)^T - (1 + g^{NYC}{}_i)^T] + \Sigma(s^{US}{}_i - s^{NYC}{}_i)(1 + g^{NYC}{}_i)^T\} + e.$$

In equation (6), e is a residual term involving differences between the squares and higher order powers of g^{US} and g^{NYC}.[31] (To the extent that the growth rates are close to zero, the higher order terms are closer to zero and can be neglected.) On the right-hand side of equation (6), the term $\Sigma s^{US}{}_i[(1 + g^{US}{}_i)^T - (1 + g^{NYC}{}_i)^T]$ tells us how much of the difference in average growth rates is due to different growth rates within industries, with industry shares held constant, while the term $\Sigma(s^{US}{}_i - s^{NYC}{}_i)(1 + g^{NYC}{}_i)^T$ tells us how much of the difference is due to the different compositions of health care employment in the Nation and New York City. (These two terms are sometimes referred to as the "within effect" and the "share effect," respectively.)

Table 7 presents the differences in growth rates for the Nation and New York City and a decomposition of those differences for the entire 1990–2008 period and three subperiods. (For the entire period and each subperiod, the within effect and the share effect sum to within 0.1 percentage point of the actual difference, indicating that the residual term in equation (6) was generally close to 0.0.) As the table indicates, average growth rates for the 1990–95 period were relatively strong in both the Nation and New York City: 3.3 percent per year and 3.0 percent, respectively. During the 1995–2002 subperiod, when a number of measures previously discussed focused on reducing the growth of spending, particularly in hospitals, the rates of employment growth fell in the United States and New York City, but the deceleration was sharper in the City, and the difference between the average growth rates widened to 0.6 percentage point. In the last subperiod in the table, the pace of employment growth accelerated in both the Nation and the City, but the difference between the two did not narrow appreciably.

For the entire 1990–2008 period, differences in the growth rate of detailed industries accounted for all of the 0.6-percentage-point difference in employment growth between the industry groups in the Nation and New York City. This finding is not entirely surprising, given that the Nation had stronger growth rates (or a smaller rate of loss) in 5 of the 7 industry components. The two detailed

Table 7. Decomposition of differences in average annual rates of change in employment in health care industries, United States and New York City, 1990–2008

[In percent]

Period	Average annual rate of change in employment in health care industries		Difference (percentage points)	Due to differences in—	
	United States	New York City		Rates of change within industries	Industry shares
1990–2008	2.4	1.8	0.6	0.7	0.1
1990–95	3.3	3.0	.3	.5	–.2
1995–2002	2.0	1.4	.6	.4	.3
2002–08	2.3	1.8	.5	.9	–.3

NOTE: The average annual rates shown for the United States and New York City are based on published employment figures from the Current Employment Statistics survey. The percentage-point differences shown result from subtracting the percentage for New York from that for the United States, for each period. The decompositions in the last two columns were calculated by means of the linear approximation discussed in the text. For each period shown, the sum of the last two columns might not equal the difference column because of nonlinearities and because growth rates were not constant within each period.

SOURCE: Bureau of Labor Statistics, Current Employment Statistics survey.

industries in which New York City had stronger growth were home health care and offices of physicians, and, as table 6 indicates, these industries had relatively small weights in equation (6). For the entire period, the share effect was relatively small (0.1 percentage point).

For the first subperiod, the within effect (0.5 percentage point) also dominated; the share effect was smaller and, again, negative (–0.2 percentage point). As table 6 indicates, private hospitals were the detailed industry with the largest share of health care employment in 1990. This fact did not hurt the City's employment growth during the 1990–95 subperiod, because employment in the City's hospitals increased an average of 2.2 percent per year, double the national average of 1.1 percent.

For the years 1995 through 2002, the result of the decomposition was somewhat different. The within effect was 0.4 percentage point, reflecting the Nation's stronger rate of growth in private hospitals, which had the largest weight in equation (6), and in outpatient care centers and State government hospitals, which had much smaller weights. Unlike the first subperiod, the second subperiod saw a positive (0.3-percentage-point) share effect that accounted for half of the total 0.6-percentage-point difference.[32] The positive share effect reflected the City's relatively higher share of employment in private hospitals. The positive share effect also reflected the City's lower share of employment in physicians' offices (9.6 percent in New York City, 14.8 percent in the Nation), as well as the strong growth rate in this industry (at or above 3.6 percent per year in both the City and the Nation).

The decomposition for the years 2002 through 2008 looks more like the decomposition for the first subperiod. Once again, the within-industry effect (0.9 percentage point) accounted for the total difference. The dominance of the within effect reflected the fact that the Nation had stronger growth in 6 of the 7 industry components. Private hospital employment in New York City increased by an average of 0.1 percent per year, while nationally the figure was 1.7 percent. One of the unusual aspects of the data for the detailed industries during these years was that State-government-owned hospitals stopped losing jobs. At the national level, employment in this segment increased, while in the City it was relatively flat. The only detailed industry in which New York City had stronger growth was home health care. The share effect (-0.3 percentage point) for this subperiod reflected the City's larger-than-national share of employment in the home health care industry.

THE YEARS 1990 THROUGH 1995, when New York City's health care industries came relatively close to matching the Nation's employment growth in those industries, were years when real spending on personal health care in New York, up an average 1.5 percent a year, grew more rapidly than national spending, up 0.9 percent per year. This larger-than-national increase in spending was accompanied by a larger-than-national increase in hospital employment in New York City, reflecting the City's traditional reliance on hospitals, rather than offices of physicians, to supply medical care.

The primary question explored in this article has been how to account for the wider difference in rates of employment growth in the years after 1995. A decomposition indicated that the difference was due both to stronger growth in detailed industries at the national level and to differences in industry composition. The growth-within-industries effect reflected superior growth rates at the national level in private hospitals, the industry with the largest share of health care employment, and in outpatient care and State government hospitals. For the years in question, New York's City composition of health care employment, with its greater-than-national reliance on hospitals and less-than-national reliance on physicians' offices, also contributed to explaining the difference between the growth rates for the health care group.

For the years 2002 through 2008, the pace of growth in health care employment accelerated in both New York City and the Nation. For the City, the acceleration was due to the home health care industry (a component of ambulatory care), which increased employment at an average rate of 3.2 percent per year from 1995 through 2002 and at a rate of 9.7 percent per year from 2002 through 2008. Other industries within ambulatory care continued to expand payroll employment at average rates at or above 2.4 percent per year. But together, these industries added only 14,300 jobs over the period. Home health care was the real jobs machine in New York City for the years 2002 through 2008, adding more than 24,700 jobs. Its growth during those years reflected population growth, particularly among the elderly, and a labor market that could supply large numbers of workers with a variety of educational backgrounds. □

Notes

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force data. The New York State Department of Labor, Division of Research and Statistics, supplied the previously unpublished information on occupational employment and wages. The author assumes responsibility for any mistakes.

[1] The stronger-than-average rate of job growth in health care goes back through at least the 1980s. See David R. H. Hiles, "Health services: the real jobs machine," *Monthly Labor Review*, November 1992, pp. 3–16; and Jennifer M. Gardner and Howard V. Hayghe, "Slower economic growth affects the 1995 labor market," *Monthly Labor Review*, March 1996, pp. 3–16. Both of these articles used data based on the Standard Industrial Classification system, whereas the current series are based on the North American Industrial Classification System. Kimberly Riley, Emily Lloyd, and Natalie Propst, "Payroll employment and job openings rate continued to grow in 2006," *Monthly Labor Review*, March 2007, pp. 19–38, documented the fact that employment in private health care, in the current series, expanded more rapidly than total nonfarm employment over the period 2003–06.

[2] Other studies of New York City's health care industries have used different combinations of industries and ownerships. For example, Maria Kouznetsova, Robert Martiniano, and Jean Moore, *The Health Care Workforce in New York, 2006: Trends in the Supply and Demand for Health Workers* (Rensselaer, New York, Center for Health Workforce Studies, School of Public Health, State University of New York at Albany, January 2008), defined the health sector as including ambulatory care, hospitals, and nursing and personal care facilities for all ownerships, including Federal and local. Residential mental retardation, mental health, and substance abuse facilities (NAICS 6232) were excluded.

[3] Examining how the growth of employment in the national, privately owned hospital industry varied over time, William C. Goodman, "Employment in hospitals: unconventional patterns over time," *Monthly Labor Review*, June 2006, pp. 3–14, found that, for the period 1990–2005, the rate of private hospital employment tended to be countercyclical.

[4] See, for example, R. Jason Faberman, "Job flows and labor dynamics in the U.S. rust belt," *Monthly Labor Review*, September 2002, pp. 3–10.

[5] Hiles, "Health services."

[6] Intercensal estimates of the resident population of the United States, by age, can be found in "National Intercensal Estimates (1990–2000)" (U.S. Census Bureau, Mar. 18, 2009), on the Internet at **www.census.gov/popest/archives/EST90INTERCENSAL/US-EST90INT-datasets.html** (visited Sept. 4, 2009). Demographic data for New York State and its counties are found in "Population Estimates" (U.S. Census Bureau, Aug. 5, 2009), on the Internet at **www.census.gov/popest/datasets.html** (visited Sept. 4, 2009).

[7] In 2007, for example, 15.3 percent of Americans lacked health insurance, but only 1.9 percent of those older than 65 were without insurance. (See Carmen DeNavas-Walt, Bernadette D. Proctor, and Jessica C. Smith, *Income, Poverty, and Health Insurance Coverage in the United States: 2007*, Current Population Reports, P60–235 (U.S. Census Bureau, 2008).)

[8] Ellen Meara, Chapin White, and David M. Cutler, "Trends in Medical Spending by Age, 1963–2000," *Health Affairs*, July/August 2004, pp. 176–83.

[9] Spending on hospitals, professional services, and prescription drugs were deflated with the use of Consumer Price Indexes. For home health services, the Producer Price Index for home health care services was used for the years 1997–2005, the CPI for medical services for 1990–97.

[10] For more detailed discussions of the Act, see *CBO Memorandum: Budgetary Implications of the Balanced Budget Act of 1997* (Congressional Budget Office, December 1997); and Steven Heffler, Katharine Levit, Sheila Smith, Cynthia Smith, Cathy Cowan, Helen Lazenby, and Mark Freeland, "Health spending growth up in 1999; faster growth expected in the future," *Health Affairs,* March/April 2001, pp. 193–203.

[11] These percentages come from the Centers for Medicare and Medicaid Services, National Health Expenditure accounts, on the Internet at **www.cms.hhs.gov/NationalHealthExpendData/02_NationalHealthAccountsHistorical.asp** (visited Sept. 3, 2009).

[12] "New York teaching hospitals participate in graduate medical education demonstration," press release (Center for Medicare and Medicaid Services, Feb. 17, 1997), on the Internet at **www.cms.hhs.gov/apps/media/press_releases.asp** (visited Sept. 3, 2009); enter "1997" in drop-down window labeled "Year". Medicare pays teaching hospitals for graduate medical education on the basis of the number of medical residents in each hospital who train and provide other services.

[13] Katharine Levit, Cynthia Smith, Cathy Cowan, Helen Lazenby, and Anne Martin, "Inflation spurs health spending in 2000," *Health Affairs*, January/February 2002, pp. 172–81.

[14] Cynthia Smith, Cathy Cowan, Stephen Heffler, Aaron Caitlin, and the National Health Accounts Team, "National health spending in 2004: recent slowdown led by prescription drug spending," *Health Affairs*, January/February 2006, pp. 186–96. The Act also created a Medicare Part D prescription drug benefit in 2006.

[15] Katharine Levit, Cathy Cowan, Bradley Braden, Jean Stiller, Arthur Sensenig, and Helen Lazenby, "National health expenditures in 1997: more slow growth," *Health Affairs*, November/December 1998, pp. 99–110.

[16] Heffler and others, "Health spending growth."

[17] Levit and others, "National health expenditures in 1997."

[18] Sharon Salit, Steven Fass, and Mark Nowak, "Out of the frying pan: New York City hospitals in an age of deregulation," *Health Affairs*, January/February 2002, pp. 127–39.

[19] *Ibid.*

[20] For more information on these educational and training categories, see *Occupational Projections and Training Data*, 2008–09 edition, Bulletin 2072 (Bureau of Labor Statistics, February 2008), Chapter 1.

[21] *Nurse retention and workforce diversity: two key issues in New York City's nursing crisis* (New York, New York Academy of Medicine and Jonas Center for Nursing Excellence, November 2006).

[22] Robert I. Lerman and Caroline Ratcliffe, "Are single mothers finding jobs without displacing other workers," *Monthly Labor Review*, July 2001, pp. 3–12. Lerman and Ratcliffe found sizable effects of welfare reform on the participation of single mothers in a number of metropolitan areas.

[23] Both the national and the New York City figures come from the Current Population Survey. The figure for New York City is unpublished. The microdata used to calculate the New York City number were obtained through **dataferrett.census.gov** (visited Apr. 18, 2009).

[24] Kouznetsova, Martiniano, and Moore, *The Health Care Workforce in New York, 2006*.

[25] *Nurse retention and workforce diversity*.

[26] In addition to the demographic and educational issues, significant numbers of nurses with degrees have chosen not to work as nurses. For a fuller discussion of why nurses chose to leave the profession, see *Nurse retention and workforce diversity*.

[27] This statement is based on unpublished data from the Current Population Survey.

[28] Kouznetsova, Martiniano, and Moore, *The Health Care Workforce in New York, 2006*.

[29] *Nurse retention and workforce diversity*.

[30] C. S. Brewer and T. Servoss, *2002 Registered nurses in New York State: county level nursing data*, cited in *Nurse retention and workforce diversity*.

[31] Other decompositions are possible. For example, the difference can be decomposed by using the local area's weights to determine the within-industry growth effect and the Nation's changes in employment to calculate the share effect. Faberman, "Job flows and labor dynamics," used averages of the two areas as weights. If this alternative were pursued, one would expect the results to be an average of the first two alternatives.

[32] The use of New York City's weights to calculate the within-industry effect yielded different numbers, but substantially the same pattern. The absolute value of the share effects became smaller for each of the three subperiods. As with the results presented in table 7, the within-industry effect accounted for more than the whole difference in employment growth during the 1990–95 subperiod. By contrast, during the 1995–2002 subperiod the share effect was positive, namely, 0.2 percentage point, and accounted for approximately one-third of the difference in employment growth.

APPENDIX: Sources and key concepts of labor market information

This article presents several different measures of employment and labor force status. Estimates of nonfarm payroll employment are from the Current Employment Statistics (CES, or establishment) survey. Estimates of occupational employment and wage rates for wage and salary workers in nonfarm establishments are from the Occupational Employment Statistics (OES) survey. Estimates of demographic characteristics and labor force participation in both New York City and the Nation are from the Current Population Survey (CPS, or household survey). The CPS is also the source of the data presented on the national unemployment rate, while the unemployment rates for New York City and the balance of New York State are from the Local Area Unemployment Statistics (LAUS) program of the Bureau of Labor Statistics (BLS). The CES, OES, and LAUS programs are Federal-State cooperative endeavors in which State employment security agencies use concepts, definitions, and technical procedures prescribed by the Bureau of Labor Statistics to prepare the data. The CPS is a sample survey of households that is conducted for the BLS by the U.S. Census Bureau.

Nonfarm payroll employment

Employment data are from the CES survey and refer to persons on establishment payrolls who receive pay for any part of the pay period that includes the 12th of the month. Persons are counted at their place of work rather than at their place of residence.

Occupational employment and wages

The OES survey defines employment as the number of workers who can be classified as full- or part-time employees, including workers on paid vacations or other types of paid leave; workers on unpaid short-term absences; salaried officers, executives, and staff members of incorporated firms; and employees for whom the reporting unit is their permanent duty station, regardless of whether that unit prepares their paycheck. Straight-time gross pay, exclusive of premium pay, counts as wages in the OES survey. The worker's base rate; cost-of-living allowances; guaranteed pay; hazardous-duty pay; incentive pay, including commissions and production bonuses; tips; and on-call pay are included. Excluded are backpay, jury duty pay, overtime pay, severance pay, shift differentials, nonproduction bonuses, the employer's cost for supplementary benefits, and tuition reimbursements.

Labor force and demographic data

The CPS and the LAUS program are the sources of the labor force and demographic data presented in the body of this article. The CPS measures employment and unemployment on a place-of-residence basis. The universe for the Current Population Survey is the civilian noninstitutional population 16 years of age and older. Employed persons are those who did any work at all for pay or profit in the reference week (the week including the 12th of the month) or who worked 15 hours or more without pay in a family business or farm, plus those not working who had a job from which they were temporarily absent, whether or not paid, for such reasons as a labor-management dispute, illness, or vacation. Unemployed persons are those who were not employed during the reference week, who had actively looked for a job sometime in the 4-week period ending with the reference week, and who were currently available for work; persons on layoff expecting recall need not be looking for work to be counted as unemployed. The labor force is the sum of employed and unemployed persons. The participation rate is the number in the labor force as a percentage of the population. The unemployment rate is the number of unemployed as a percentage of the labor force. The LAUS program uses the same concepts of labor force status, employment, and unemployment as the CPS.