THE CHANGING HEALTH CARE SYSTEM IN NEW YORK CITY: IMPLICATIONS FOR THE HEALTH WORKFORCE

A Report to

The Planning and Placement Fund
of
1199/League Employment, Training, and Job Security Fund

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PREFACE

In the summer of 1996 the Planning and Placement Fund of the 1199/League Employment, training and Job Security Program, concerned about potential downsizing of hospitals and related loss of jobs in New York City, contracted with The Center for Health Workforce Studies and New Century Concepts to conduct a study to assess:

1. potential losses of hospital jobs in New York City over the next several years with as much specificity as possible about what occupations and professions are vulnerable;
2. occupations and professions with strong potential for job growth in the health care industry in New York City over the same time period;
3. the potential to retrain hospital workers at risk for job loss for jobs in hospitals and non-hospital settings for which demand is expected to increase; and
4. the potential impact of new technologies on hospital employment in New York City.

The Center for Health Workforce Studies, at the School of Public Health of the University at Albany of SUNY in Rensselaer, New York, is dedicated to policy-relevant data collection and analysis to promote the education, training, and deployment of a workforce consistent with health care needs. The Center had lead responsibility for the overall study, including this report and the qualitative research.

New Century Concepts, located in New York City, is an economic consulting firm specializing in the health care industry. New Century Concepts had lead responsibility for data collection and analysis, including the econometric models forecasting overall hospital employment, the employment projections by occupation, and the technology study.

The principal authors of this summary report are Paul Wing and Edward S. Salsberg of the Center for Health Workforce Studies and Curtis Skinner of New Century Concepts. The interviews were coordinated and conducted by Barbara Hill, a consultant to the project, with assistance from Mr. Salsberg and Dr. Wing. Also assisting were Mark Dionne, Joe Nolan, and Kristin Law of the Center.

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I. EXECUTIVE SUMMARY

The health care industry in New York City is in the midst of a major transformation. Competition is increasing, hospitals are merging and consolidating, health care networks are forming, and managed care is expanding. While it is difficult to predict the ultimate configuration of the health care system in New York City, especially which facilities will grow and which ones will shrink and perhaps even disappear, the direction of the changes and their potential impact on the workforce are becoming clear.

This study, which is based on structured interviews with health care leaders in the city and extensive data analysis, has examined this situation in detail and produced a number of findings and recommendations:

1. The hospital workforce in New York City has already begun to shrink, and the pace of reductions will increase. We estimate that there will be a loss of about 15% of all hospital jobs between 1997 and 2000, representing a loss of 27,600 full time equivalent (FTE) positions.

2. This workforce reduction will come on top of an estimated loss of 9,000 FTE hospital positions (5%) between 1995 and 1997.

3. Future job losses could be considerably higher, and could occur more quickly, if there are major short term reductions in publicly financed health care, such as cuts in Medicaid and Medicare. A rapid, major cutback in welfare eligibility could also increase the size and pace of job losses in healthcare.

4. Although most of the job losses over the past two years have been at municipal hospitals, we believe that as much as 80 percent of job losses over the next three years (22,000 FTE positions) will be in voluntary hospitals. This reflects both the larger size of the voluntary hospital sector and the significant job reductions already made by the Health and Hospitals Corporation.

5. The projected workforce reductions are expected to affect all categories of workers, but occupations that provide direct services to patients are particularly vulnerable. These include registered nurses, LPNs, nurse aides, housekeepers, and food service workers. Of the total of 22,000 FTE positions lost in voluntary hospitals over the next three years, we expect approximately 50 percent (11,000 FTE positions) will be in occupations represented by Local 1199, excluding nursing positions which will account for another 25 percent of the losses. The remaining 25 percent of losses will be in administrative and professional positions, including physicians.

6. We project limited growth in jobs in non-hospital settings, particularly ambulatory care and home care. Among the occupations expected to grow are: home health aide, personal care aide, medical assistant, medical record technician, physical therapist, and occupational

therapist. However, job losses in hospitals are expected to exceed this growth by a wide margin. Some of these losses will be accommodated through normal retirements and natural attrition. However, the majority of the 11,000 FTE losses in the occupations represented by Local 1199, perhaps as many 9,000 positions, will be vulnerable to layoffs. A number of special initiatives (e.g., training or early retirement programs) have been identified that may mitigate the impact of the decline.

7. Advances in technology, especially automated laboratories and new imaging devices, are expected to lead to significant reductions in lab and X-ray technicians and other ancillary staff.

8. Hospital management will not be immune from cutbacks. In fact, mergers and cost pressures have already resulted in significant cuts in middle and senior management at some hospitals.

If the projected cutbacks in hospital jobs can be spread over three to four years, labor and management will have important opportunities to minimize the negative impact on workers, health facilities, and patients. Our interviews with management revealed an openness to creative solutions that minimize the negative impact on people and facilities. Discussions with leaders at the Employment, Training and Job Security Program indicate a parallel interest in developing collaborative programs and responses. Thus, while hospitals will need fewer total worker hours, it may be possible to identify strategies that achieve this goal with minimal disruption of workers and facilities. Three kinds of initiatives are needed to help cope with this downsizing.

Initiatives Related to Education and Training

1. Increased funding for basic education and skills development for health workers;

2. Continued support for retraining of workers for new positions within hospitals;

3. Better linkages between hospitals and community health centers, managed care organizations, physician offices, and non-hospital settings;

4. Expanded opportunities for displaced workers to find employment in other industries;

5. Reduction of barriers to movement of workers between sites inside a health network;

6. More flexibility in state funding for retraining.

Initiatives Related to Downsizing

Since there will not be enough new jobs in health care for every displaced worker, and not every worker will be interested in retraining, there will be a need for creative approaches to downsizing and cost reduction to assist both management and workers. Labor and management should work together to explore a variety of options including:

1. Improved early retirement incentive programs;

2. Opportunities for voluntary work reductions by experienced employees (e.g., part-time employment and job sharing) with appropriate fringe benefits;

3. Linking educational opportunities and other incentives with voluntary reductions in work hours;

4. Creation of new organizations to use displaced workers to compete for contracts with hospitals;

5. Collaborations to improve productivity and reduce cost to permit retention of more workers.

Initiatives to Monitor the Workforce

There is an urgent need for more accurate, up-to-date information on the evolving supply and demand for workers in specific health care settings and occupations. It is not possible with current information sources to predict with confidence the demand by occupation beyond the next two or three years. For a small investment, the health care community could extend current data collection to provide a more useful system of indicators and benchmarks of supply and demand of workers by occupation to inform both facility managers and health and education policy makers. We recommend that an Ad Hoc Labor-Management Committee on Data Collection guide the development of this health workforce monitoring system.

The Bottom Line

Labor and management have worked effectively together in New York City in recent years to support an orderly transition of the health industry. The coming crises in the workforce will challenge that collaboration. If labor and management act now, this crisis can be turned to the advantage of both, and more importantly to the advantage of patients and taxpayers. A better trained, more secure workforce is in the best interest of patients, workers, management, and the general public.

II. PRINCIPAL FINDINGS

A. THE FUTURE NEW YORK CITY HEALTH WORKFORCE

1. Hospital beds in New York City will decline significantly. We estimate the number of hospital beds will fall by 32% - almost 11,000 beds- between 1995 and 2000. This forecast is consistent with those of recent studies. In 1995, a study by New York University [3] predicted that bed use would drop by 36% between 1995 and 2000. According to a recent United Hospital Fund analysis, hospital days dropped by 21% between the first quarter 1992 and the first quarter 1996. [9] Interviews with hospital leaders in late 1996 found widespread belief that this decline in hospital use will continue, confirming the findings from our econometric models.

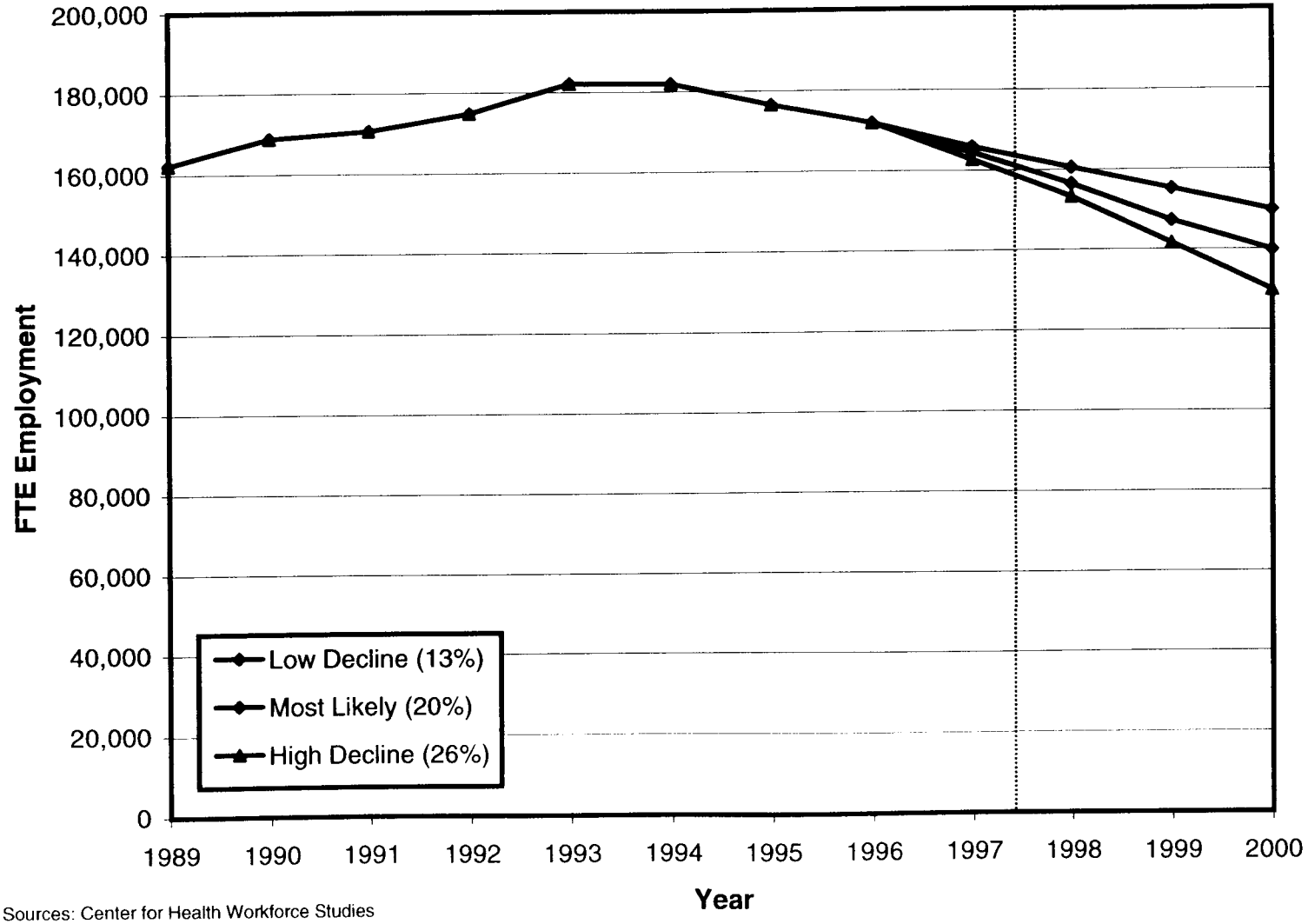
The decline in hospital days between 1992 and 1996 was driven almost exclusively by the drop in length of stay. In fact, the *rate of decrease in hospital patient days has increased each year for the past 4 years*, with an 8% decrease between 1995 and 1996 alone [9]. Length of stay is expected to continue to drop. Admissions are also expected to drop with the expansion of managed care (especially Medicaid Managed Care) and the expansion of services available on an ambulatory basis.

2. There will be a loss of 27,600 FTEs in hospitals between 1997 and 2000 on top of a loss of 9,000 FTEs in the prior two years. This represents a loss of 20 percent of FTEs in hospitals in New York City between 1995 and 2000. This estimate is based on a number of analysis including innovative economic models and qualitative evidence. Depending on a variety of factors, the total hospital job loss over the next three years could be higher or lower. However, based on a review of a variety of analytical and political factors, we believe the most probable loss is 36,600 FTEs over the 5-year period. Figure 1 presents the projected change in overall hospital employment. A summary of the methods and assumptions used in estimating hospital job losses is provided in Section IV of this report and in greater detail in Appendix C.

This drop reflects a variety of factors, especially the decrease in length of stay and the drop in admissions. Furthermore, mergers, consolidations or re-engineering of jobs and efforts to improve efficiency are likely to lead to a decrease in staff per patient day. According to the American Hospital Association data, New York's staff per patient day in 1994 was 10% higher than the average for 74 metropolitan areas. (Section IV)

3. Major cutbacks in the short run in Medicaid, Medicare and/or welfare eligibility could significantly increase this number of workers at risk and speed up the job loss. Our estimates of job losses are based on assumptions of continued expansion of competition, reductions in hospital use, expanded managed care, and continued cost reductions. They also make allowances for cuts in Federal and state health care spending. We believe there are opportunities for labor and management to collaborate minimize the negative consequences of the anticipated reductions. However, major cuts in government programs could prevent a more orderly approach to downsizing. Major short term cuts in funding could lead to a greater and more rapid loss of jobs over the next three years.

Figure 1. HOSPITAL EMPLOYMENT IN NEW YORK CITY
Historical Levels and Projections to 2000



Sources: Center for Health Workforce Studies
New Century Concepts

4. The majority of the job losses over the next three years will occur in the voluntary hospitals. Although most of the job losses over the past two years have been at municipal hospitals, we believe that as much as 80 percent of job losses over the next three years (22,000 FTE positions) will be in voluntary hospitals. This reflects both the larger size of the voluntary hospital sector and the significant job reductions already made by the Health and Hospitals Corporation.

5. Hospital job losses will occur for most categories of workers, but service workers will be particularly vulnerable. Because the cutbacks will be driven by decreases in inpatient utilization, direct patient care workers and their support staff will be especially vulnerable. This includes nurse aides, food service workers, housekeepers, and LPNs. Registered nurses are also expected to decline, especially at the bedside, although there is likely to be some growth in job opportunities for RNs in hospital ambulatory care settings. Changes in laboratory and radiologic technologies are also expected to result in major workforce reductions for workers in these areas. Management will not be spared; many management jobs have already been cut. Many more managers are likely to be cut as hospitals merge and consolidate. The re-engineering of the workplace now underway is likely to result in a "flattening" of the job hierarchy with more multi-skilled workers and fewer managers, operating units, and job titles.

Table 1 presents projections of hospital job losses (FTE) by occupation. Section V provides additional detail for selected occupations. These projections reflect our econometric models, the comments of hospital leaders, and the 1995 and 1996 employment surveys conducted by the Greater New York Hospital Association.

Of the 22,000 FTE positions we estimate will be lost in voluntary hospitals over the next three years, we expect approximately 50 percent (11,000 FTE positions) will be in 1199-represented occupations, excluding nursing positions which will account for another 25 percent of the losses. The remaining 25 percent of losses will be in administrative and professional positions, including physicians.

6. There will be growth in several health professions and occupations in New York City over the next few years. Although it is difficult to develop precise estimates of the growth of specific occupations, seven professions and occupations are expected to grow between 1995 and 2000:

Home Health Aide. Our estimate of the growth in this occupation in New York City is 2,570 FTE positions.

Personal Care Aide. Our estimate of the growth in this occupation, which appears primarily in home care settings, in New York City is 1,230 FTE positions.

Medical Assistant. Our estimate of the growth in this occupation in New York City is 1,090 FTE positions, 470 of which will be in hospitals.

Medical Records Technician. Our estimate of the growth in this occupation in New York City is 300 FTE positions, 130 of which will be in hospitals.

Physical Therapist. Our estimate of the growth in this profession in New York City is 270 FTE positions, the majority of which will be in physician offices.

Table 1. HOSPITAL WORKFORCE IN NEW YORK CITY
Historical FTE Employment and Projections to 2000

		Estimated FTEs†		Change, 1995-2000	
	1993*	1995	2000	#	%
SERVICE OCCUPATIONS**					
Housekeeping Aides	7,683	8,600	6,200	-2,400	-28%
Food Service Workers	6,024	6,150	3,830	-2,320	-38%
Maintenance Workers	4,100	4,820	4,230	-590	-12%
Nurse Aides, Orderlies, etc.	15,160	15,600	9,850	-5,750	-37%
CLERICAL & ADMINISTRATIVE SUPPORT					
Clerks, All Titles**	13,835	15,200	12,820	-2,380	-16%
All Other Secretarial/Clerical/Admin**	14,603	14,000	11,810	-2,190	-16%
Medical Records Technicians	1,268	1,300	1,450	150	12%
Medical Records Administrators	336	240	370	130	54%
TECHNICIAN OCCUPATIONS					
Radiographer & Related	1,861	2,000	1,780	-220	-11%
Radiation Therapy Technicians	240	240	240	0	0%
Other Radiological Personnel	1,065	1,100	880	-220	-20%
Medical Technologists	3,874	3,880	2,800	-1,080	-28%
Other Medical Technicians	2,840	2,800	2,020	-780	-28%
Pharmacy Technicians	745	760	560	-200	-26%
Dietitians	810	810	460	-350	-43%
Dietetic Technicians	1,062	1,050	600	-450	-43%
PROFESSIONAL & NURSING					
Registered Nurses	36,729	36,050	28,410	-7,640	-21%
Licensed Practical Nurses	3,755	3,510	2,200	-1,310	-37%
Physician Assistants	784	830	1,110	280	34%
THERAPISTS					
Physical Therapists	652	600	630	30	5%
Physical Therapy Assistants	276	300	330	30	10%
Occupational Therapists	307	300	300	0	0%
Occupational Therapy Assistants	79	80	80	0	0%
Respiratory Therapists	1,086	1,120	810	-310	-28%
Respiratory Therapy Technicians	281	280	200	-80	-29%
SUBTOTAL	**119,455**	**121,620**	**93,970**	**-27,650**	**-23%**
OTHER	**62,556**	**60,380**	**51,430**	**-8,950**	**-15%**
Administrators	5,329				
Physicians	6,796				
Medical Residents	10,613				
Social Workers	2,551				
Speech Pathologists	136				
Other Professional	12,381				
Other NEC	24,750				
TOTAL	**182,011**	**182,000**	**145,400**	**-36,600**	**-20%**

* Source: AHA, except for Service Occupations; Clerks, All Titles; and All Other Secretarial/Clerical/Administrative

** Source: Institutional Cost Reports

† Estimates & projections have been developed by the Center for Health Workforce Studies and New Century Concepts

Physical Therapy Assistant. Our estimate of the growth in this profession in New York City is 200 FTE positions, the majority of which will be in Diagnostic & Treatment Centers.

Occupational Therapist. Our estimate of the growth in this profession in New York City is 80 FTE positions none of which will be in hospitals.

In addition to these seven professions and occupations, we expect continuing growth in the numbers of multi-skilled workers, including "patient care assistants," especially in hospital settings. Because these occupations are so new, and because most of them are defined and trained in the individual hospitals in which they work, it is very difficult to estimate the magnitude of growth. We also expect growth in several other classes of ambulatory care workers, especially clerical and other support workers with multiple skills.

7. The growth in jobs in hospitals, ambulatory care settings, and home care will not be sufficient to offset inpatient hospital job losses. Although many hospitals using additional multi-skilled workers, and there will be some growth in ambulatory care and home care services, the increases in these programs will be no where near large enough to offset the job losses expected in inpatient services. Our interviews with hospital ambulatory care administrators and health center staff (see Section VI) revealed that ambulatory care and home care programs are facing the same levels of competition and pressure to contain costs as the inpatient programs. There are concerns that managed care plans will not provide sufficient funding to expand primary care services. Some job growth is expected in ambulatory and home care settings (Table 2). Appendices D and E provides additional detail with projections by occupation.

Ambulatory care is growing rapidly in New York City, as it is elsewhere. This growth is not expected to produce employment opportunities nearly great enough to offset the decline in inpatient services. Because the intensity of care required in ambulatory settings is typically lower than in inpatient settings, a smaller proportion of highly skilled patient care workers is required. In addition, the "food and lodging" components of hospital services are not needed in ambulatory care facilities. Ambulatory care facilities are also typically small and geographically dispersed, which creates requirements for different kinds of workers.

Home care in New York City is well established and significant opportunities for expansion in total workers may not exist. Many hospital executives indicated plans to expand their own home care services; however, this may represent a shift between providers rather than an expansion in total services. In fact, there are discussions underway for Medicare and Medicaid regarding approaches to paying a set amount per episode of illness or some other method of financing to provide an incentive to improve efficiency. This, combined with the already large system in New York City, may limit future growth. Even if home care does continue to grow, salaries of many of the home health aides and personal care workers are so far below hospital workers that few hospital workers are likely to be interested in switching to home care. There may be more opportunities for registered nurses in home care; however, based on conversations with the representative of the home care industry, the transition from inpatient to home care settings can be difficult and retraining support would be important.

8. Technological developments and new medical treatments and interventions will, in the short run, reduce the need for workers. Improved technologies of all types will exert pressures

Table 2. PROJECTED CHANGES IN FTE HEALTH CARE EMPLOYMENT IN NEW YORK CITY, 1995 to 2000 By Profession/Occupation and Health Care Setting

PROFESSION / OCCUPATION	HEALTH CARE SETTING					TOTAL
	Hospitals & Hospital-Owned Clinics	Diagnostic & Treatment Centers	Offices of Physicians & Others	Home Health Agencies	Nursing Homes	
RN	-7,640	90	130	320	0	-7,100
LPN	-1,310	50	80	160	240	-780
Medical Assistant	470	60	560	n/a	n/a	1,090
Medical Records Technician	150	50	80	n/a	40	320
Radiographer & Related	-440	0	80	n/a	n/a	-360
Clinical Lab Tech	-1,860	20	50	n/a	n/a	-1,790
Pharmacy Technician	-200	0	n/a	n/a	n/a	-200
Dietitian	-350	40	n/a	n/a	n/a	-310
Dietetic Technician	-450	0	n/a	n/a	n/a	-450
Physical Therapist	30	20	160	20	40	270
Physical Therapy Assistant	30	130	n/a	10	20	190
Occupational Therapist	0	10	40	0	20	70
Respiratory Therapist	-310	0	n/a	n/a	n/a	-310
Respiratory Therapy Tech	-80	0	n/a	n/a	n/a	-80
Food Service Worker	-2,320	0	0	0	-40	-2,360
Housekeeper	-2,400	30	0	n/a	-50	-2,420
Maintenance Worker	-590	20	n/a	0	-30	-600
Nurse Aide, Orderly, Attendant	-5,750	0	0	0	-1,160	-6,910
Clerical & Admin. Support	-2,380	190	100	n/a	-170	-2,260
Home Health Aide	n/a	0	0	2,570	0	2,570
Personal Care Aide	n/a	n/a	n/a	1,230	n/a	1,230
Other	-11,200	n/a	n/a	n/a	n/a	-11,200
TOTAL	**-36,600**	**710**	**1,280**	**4,310**	**-1,090**	**-31,390**

Note: All estimates are rounded to the nearest 10.

Source: Center for Health Workforce Studies and New Century Concepts

to reduce the numbers of hospital workers, continuing a trend underway for many years. A number of new technologies are now being introduced in both inpatient and outpatient settings, including: computerized information systems; portable medical devices and telemedicine facilitating a shift in care to non-hospital settings; totally automated medical laboratories, reducing the need for lab technicians; arthroscopic surgical techniques that have dramatically reduced (and in many instances eliminated) hospital stays; new imaging systems to help diagnose illnesses; and new pharmaceutical "cocktails" that have significantly reduced hospital stays of AIDS/HIV patients. In fact, the average daily census of hospitalized AIDS/HIV patients declined by nearly 800 between January 1995 and November 1996. [6]

Historically, new technologies have tended to be designed to improve quality of care and outcomes, often with little regard for costs. Many of the newer technologies, however, are designed explicitly to improve efficiency and reduce costs. As managed care and competition penetrate further into the health care industry, there will continue to be strong incentives for managers at all levels to reduce costs, including through new technologies. Cost savings from these new technologies often involve staff cutbacks; additional workforce reductions in hospitals can be expected in the future as managers introduce more new cost-saving technologies.

Section VII provides an overview of the impact of new technologies on the health care workforce, and Appendix F provides an in-depth review and analysis of the technologies most likely to impact on hospital workers.

9. The health industry will require workers that are better educated, more skilled, and more flexible, regardless of specific occupation. The health care worker of the future in New York City will need to be computer literate, with strong language skills -- preferably being bilingual -- and strong interpersonal skills. Workers will also have to be more customer-oriented. This was stated consistently and clearly in all of the interviews with hospital and health center administrators. (see Section VI and Appendix B)

The health care industry is already moving in this direction, with widespread adoption of multi-skilled "patient care associates" in clinical settings, multi-skilled "technicians" in laboratory settings, and multi-skilled "clerks" in a variety of settings. Many of the new multi-skilled occupations are part of a larger strategy of reducing labor costs by "down-skilling" selected tasks by substituting workers with less training and education for RNs, LPNs, and other senior health professionals. More of these multi-skilled workers can be expected in the future in areas like accounting, billing, and patient education.

10. Re-engineering of hospital services will continue, although more of this will be in administrative and other non-patient care functions and roles. Few hospitals seem prepared or interested in wholesale redesign of patient care services beyond the continued introduction of new multi-skilled workers who are generally more flexible and less expensive than traditional hospital workers. More comprehensive shifts in clinical practices and philosophies (e.g., patient-focused care) seem likely to be limited in application.

B. FINDINGS AND RECOMMENDATIONS

The loss of 27,600 FTE jobs between 1997 and 2000 will create many problems for the individuals directly affected. Those remaining in hospital employment will also be affected either

through personal relationships or through bumping and internal job changes. The downsizing may also cause major disruptions for the hospitals and other health facilities. Nevertheless, the expected downsizing of the workforce may also serve as an opportunity for labor and management to reorganize and reorient for a more stable future. Based on the review of the data and interviews with management and leaders at the Employment, Training and Job Security Program, the authors believe there is a unique opportunity in New York City to respond to the downsizing through job retraining and placement and through the creative restructuring of work that can benefit workers, management and patients.

For several years, the health industry in New York City has invested in worker retraining and there has been extensive collaboration on these efforts between the 1199/League Employment, Training and Job Security Program, the Greater New York Hospital Association, and the State Department of Health. Others, such as CUNY, the Health and Hospitals Corporation, and District Council 37, have also been active in this collaboration. This is a critical experience on which to build a positive response to the new challenges. In addition, the funding available in New York City through labor and management funds and the New York State Health Care Reform Act, provide a foundation for financing needed actions.

Although there have been significant layoffs in hospitals in recent years, the majority of the downsizing of the workforce over the past two years has been accomplished through normal attrition and early retirement incentives. Statistics compiled by the Greater New York Hospital Association show that only 25 percent of recent downsizing resulted from layoffs. All forms of forced downsizing create organizational problems and mismatches of staff and jobs. Among the problems that may be introduced are: lower employee morale; loss of younger workers due to bumping from layoffs; and loss of desirable staff in early retirement programs. Downsizing also raises questions about the viability of the organization. Some of these problems can be addressed through training and retraining programs; others can be minimized through the development of innovative approaches to downsizing Based on our interviews, hospital administrators seem genuinely interested in avoiding layoffs. The following are our finding and recommendations related to retraining and downsizing.

1. Findings and Recommendations Related to Education, Training, and Retraining

Increase funding for basic education and skills development: Hospitals and ambulatory care facility executives were clear--they need multi-skilled and flexible workers. They need workers with better language and communication skills and workers that are computer literate and consumer oriented. Meeting these needs will improve patient care, strengthen health facilities and help workers both at work and throughout their lives. Given the pace of change in health care and the demands of health care for the twenty first century, life long learning is essential.

To provide this training requires a greater investment in basic skills and education for workers. In our interviews, hospital executives consistently recognized the need to increase their investment in worker education and training. Unfortunately, in the competition for limited funds and the time and attention of management, training and education are often neglected. Labor and management need to make a firm commitment to support for basic education and training.

Continue to Support Retraining of Workers within Hospitals: While hospitals are downsizing, there is still a need for additional workers in selected occupations and for upgrading in other occupations. For example, we expect significant demand to upgrade nurse aides to multi-skilled patient care assistants and support staff. We also predict increased demand in hospitals for therapists, therapy assistants, nurse practitioners and physician assistants. The development of networks providing services along a continuum of care also offers opportunities for retraining and placement.

Expand linkages with Community Health Centers, Managed Care Organizations, Physicians' Offices and other Non-Hospital Settings: There will be some growth in jobs in health care settings not within a hospital network. However, this growth will be widely dispersed with a few workers at each site. In addition, hospital titles and positions are often not directly parallel to positions in these settings. Crosswalks and training modules need to be developed to match workers with positions. This requires intensive collaboration between hospitals, the Employment, Training and Job Security Program and these other sites.

Discussions with health centers, managed care organizations, home care agencies and others found a general receptivity to hiring retrained hospital workers. While there was occasional concern regarding employing workers who have been in a union, this was not a major issue.

There was some concern that hospital workers will find it difficult to adjust to the different working environment -- both in terms of the need to carry out a broader range of activities and the need for a customer service orientation. But most sites were willing to try hiring retrained hospital workers. The proposal by the Job Security Fund to provide specific training, tailored to the needs of non-hospital sites, was viewed very positively.

Continue to Explore Possible Job Opportunities Outside of Health Care: Service workers are at greatest risk for job losses. Unfortunately, anecdotal evidence suggests that opportunities outside health care are limited. In general, the job opportunities for service workers are either low paying or dispersed and hard to locate. While jobs do exist, such as in restaurants for food service workers, and in the hotel industry for housekeepers, many of these positions offer salaries well below those of hospital workers in similar positions. Nevertheless, it is recommended that the Job Security Fund continue to explore employment possibilities outside of health care.

Labor and management need to explore ways to remove barriers to movement between sites in a network: The development of networks and mergers between facilities create challenges for labor and management. What happens when two sites merge and one is unionized and the other is not? What happens if the sites have employees represented by two different unions? What happens if both sites are represented by the same union, does seniority apply to the site or to union membership? If a hospital is developing small primary care sites where all workers interact extensively with patients, can they select existing workers who are community-oriented but lack the seniority of other workers?

In the interviews with hospital senior management, many managers expressed frustration with the inflexibility of some union rules which they viewed as counter to their efforts to be competitive.

In other cases, it appears that management has purposely avoided trying to move workers between sites in their networks, preferring to try to recruit a candidate from the outside with the specific skills they need. It is in the best interest of labor and management to collectively explore approaches to maximize opportunities for experienced workers to be retrained to meet the future needs and to remove barriers to their movement within networks.

State funding for retraining should allow for greater flexibility: The new funds available for retraining under the New York State Health Care Reform Act provide a major resource for retraining current workers. One potential concern with the state program is the level of specificity required prior to the beginning of a contract year. This includes the need to identify individual workers to be retrained and the jobs that will be available to them. While some specificity is appropriate, it is not possible to know ahead of time the specific workers, institutions, and job categories that will be downsized during the year.

One approach would be to allow grantees to periodically provide updates and modifications with the understanding at the outset that the specific individuals, institutions, and positions may evolve as the contract year progresses. Another approach would be to allow for applications every six months.

Another concern is the limitation on the use of the funds for general skills upgrading. Providing general skills, such as computer literacy and improved language skills will make individuals more marketable for a variety of jobs. Nevertheless, priority should continue to be to help laid off or about-to-be-laid off workers.

2. Findings and Recommendations on Downsizing

A joint labor-management task force should be established immediately to explore creative approaches to cost reduction that assist both management and workers. Since not every worker will be appropriate or interested in retraining, and there will not be enough new jobs in health care for all displaced hospital workers, this will require extensive cooperation. Strategies to explore include, but are not limited to, the following:

Improving early retirement incentives and programs. Early retirement programs have been used successfully by many organizations to soften the impact of significant staff reductions. Current programs for health care workers in New York City provide little incentive for workers to retire early. Between 10,000 and 13,000 health care workers in New York City are now 60 or older and have 15 years of service, and are therefore potential candidates for early retirement. If labor and management work together to design enriched programs to induce larger numbers of early retirements, many workers displaced by the downsizing could be helped through this difficult time.

Allowing part time work and/or job sharing with full benefits for experienced workers. Some, perhaps even many, workers may be willing to voluntarily reduce their hours if they could maintain their benefits. This may be particularly attractive to older workers or workers with family responsibilities. Although many administrative and scheduling issues would need to be

worked out, this could help management meet service needs at peak periods and assist workers.

Linking educational opportunities with voluntary reductions in work hours. Some workers may be willing to work fewer hours in return for an opportunity to study. For example, CUNY could offer a program one full day a week and students could attend a "Friday school." This would reduce the need for involuntary reductions in staffing and provides important educational opportunities for workers.

Developing new organizations that could use displaced workers to compete for outsourcing contracts. Many hospitals desire to expand the practice of outsourcing selected services to outside contractors. Unfortunately, this would reduce the hospital workforce even more. Union agreements currently prevent most outsourcing of tasks and services. Pressures to reduce costs will encourage a modest expansion of external contracts for a wide range of administrative and support services. Outside contractors generally pay lower wages than hospitals for similar work; and because they are newer organizations, they often have the advantage of greater production efficiencies. The new organizations could compete for outsourcing contracts for services required by hospitals and other health care units. This would provide employment opportunities for hospital workers displaced by downsizing and restructuring. Presumably, the new operators would be able to take advantage of new capital to operate more efficiently than the in-house operations they will replace.

Providing options for a reduced work week. One approach to reducing the total workforce while minimizing layoffs would be to reduce hours worked per week. As part of this strategy labor and management must identify mutually acceptable compensation levels and fringe benefit packages.

Encouraging worker-management collaborations to identify strategies to improve productivity and cut costs. Since the ultimate goal is to reduce costs, consideration should be given to establishing a process that encourages workers and management to share ideas on reducing costs, improving productivity, and increasing revenues. Workers are very knowledgeable about hospital operations and can make significant contributions to achieving these goals.

Exploring possible efficiencies through improved supply technologies and information systems. If such initiatives were developed with appropriate job security guarantees, programs of this type could result in significant savings, especially in the long run.

3. Recommendations for Monitoring Workforce Supply & Demand and Targeting Funds for Training

The pace of change in health care in New York City makes it extremely difficult to predict future supply and demand by occupation and setting. In addition, while there are some sources of data on the workforce, they are limited in scope and use different definitions and time frames. This makes it difficult to answer even relatively simple questions, such as how many nurse aides are currently employed in hospitals.

Labor and management should establish an Ad Hoc Labor/Management Committee on Health Workforce Data to guide the development of a workforce monitoring and tracking system to help target training funds. This system should build on existing data sources including the Department of Labor, the American Hospital Association, state cost reports, the annual survey on hospital and nursing home employment conducted by the Greater New York Hospital Association, and the United Hospital Fund tracking of patient days. This data base should be supplemented with quarterly data on a range of occupations from selected health facilities. In addition, regular data on enrollment and graduations from health professions education programs in the city should also be carefully tracked.

This information will help target funds for training and retraining programs sponsored by New York State and the 1199/League Employment, Training and Job Security Program. It will also help health professions education programs to respond more quickly to local needs. In addition, it will help prospective health workers and students in selecting career tracks and educational programs.

III. BACKGROUND

The health care industry is a major employer in New York City, generating more than 370,000 full-time and part-time jobs in 1996 (Figure 2). It is also one of few industries in New York City in which employment has risen over the past decade. Between 1982 and 1994, health care employment rose by more than 23 percent, driven in large part by increases in the hospital workforce which grew by more than 34,000 FTEs over this 14 year period [7].

A. THE NEW YORK CITY ENVIRONMENT

For many years, observers have suggested that New York City's health care system was different from the rest of the nation and that changes elsewhere would affect New York City differently. There are some unusual features of New York's health care system, including: a long term commitment to care for the poor, including though Medicaid and the large municipal hospital system; a concentration of academic health centers; a commitment to not-for-profit health care; extensive government regulation; and a heavily unionized health workforce. While all of this is true and it does make New York unique, many of the changes are inevitable. In fact, every indication is that these forces of change will hit New York City hard. New York may be especially vulnerable to change at this time for the following reasons:

An abundance of providers and purchasers and expansion of competition: New York City has an abundance of all types of hospitals, physicians, managed care plans and insurers. New York also has a large number of entrepreneurs and investors, who may apply pressure to permit publicly held hospitals to operate in New York.

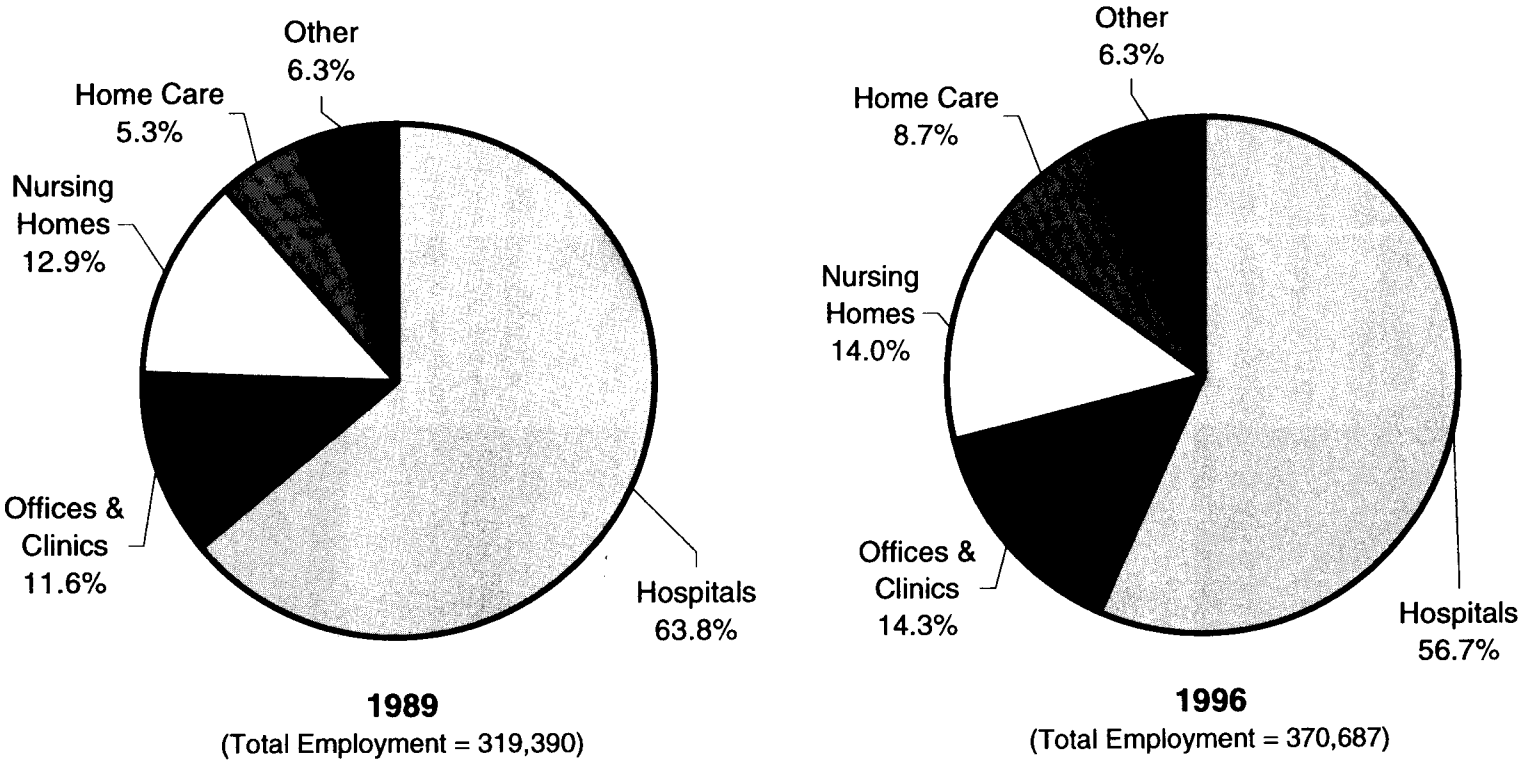
Deregulation of rate setting: Effective January 1997, New York State government ended more than 15 years of state rate setting for private insurers. This allows insurers and purchasers to negotiate more freely with providers

Frustrated purchasers and employers: The high cost of health care in New York, including for health insurance premiums and Medicaid, has encouraged private insurers, employers and government to search for ways to constrain costs. The business community will support efforts to expand competition if it results in lower premium costs.

The expansion of managed care: Although managed care continues to evolve from the early concept of the staff model HMO, the basic concept continues to expand as providers assume responsibility, usually with financial risk, for some portion of the care of a population. The paradigm shifts from an incentive to provide more services to an incentive to restrict the use of services and reduce costs.

The development of networks: As the competitive marketplace expands, there is a strong incentive to reorganize the delivery system including the development of partnerships and networks. This is usually designed to improve efficiency through scale economies and improved market position.

Figure 2. HEALTH CARE EMPLOYMENT IN NEW YORK CITY
Headcount Employment, By Health Care Sector, 1989 and 1996



Source: NYS Department of Labor

While New York City may lag behind many parts of U.S., especially the West Coast, in creating this new health care environment, major change is inevitable. Although it can be hard to quantify the size of the changes and to specify exact time frames, the general directions are clear.

B. PREVIOUS STUDIES

Several recent studies have examined the changing health care workforce in New York City. All predicted reductions in the health care workforce, especially in hospitals. All were limited by the fact that the downturn predicted by many observers was not yet evident in historical data collected regularly by private associations and government agencies. Despite their limitations, these studies were important precursors to this study, and each is summarized briefly below.

Billings, *et al* projected a reduction in hospital beds of 35 percent or more in New York City by the year 2000 [3]. Their estimates, prepared in 1996 on a hospital by hospital basis, assume that each hospital in the City will adjust beds and workforce to approximate national hospital utilization averages. Their estimates of the impact of these changes on the workforce were more modest, with an estimated decline of approximately 10 percent.

A study by the New York City Health Systems Agency (HSA) in early 1996 concluded that "a third of New York City's hospital beds may not be needed by the year 2000," due to decreases in length of stay and reductions in admissions per capita [8].

A study conducted by the Labor Research Association in 1995 also predicted major changes in the health care system in New York City [10]. This study focused more on changes in organizational arrangements and financing mechanisms, and less on changes in employment. The conclusions, however, are consistent with the studies by Billings and the HSA, even though their predicted reductions in the health care workforce changes are smaller than most recent studies.

A 1994 study by Berliner and Kovner also examined this question, with special attention to implications for the hospital workforce. Their study concluded that there would be major reductions in the health care workforce [2]. Berliner and Kovner concluded that "the strong reduction in hospital employment will overshadow the growth of the health sector in other areas, at least over the next three years." [2, p.2] Workforce statistics for 1996, now becoming available, are bearing out this conclusion.

C. THIS STUDY

Although all of these studies examined the future of the health care workforce in New York City, only the Berliner study provides sufficient detail on specific professions and occupations to provide useful guidance to those attempting to respond to the changes now taking place, and they dealt with only eight occupations. This study has been designed to update their study to the year 2000 and to provide additional detail to support local responses. It examines the health system and the health workforce from several different perspectives, including computer models, interviews with hospital executives, and a special study of the impact of new technologies on the health care workforce. Detailed projections are provided for 26 different professions and occupations in New York City.

1. Key Elements

The primary objective of this study is to estimate the increases and decreases that will occur in the numbers of specific health professions and occupations in New York City. These estimates will inform health care planning and policy making in the system, and guide the development of training programs to help minimize dislocations of workers that may lose their jobs in the next few years. The study has several key elements:

- a statistical analysis of detailed occupational employment data to estimate the future demand for health care workers in each of 22 health professions and occupations;
- a series of interviews with CEOs and other officials of a random sample of hospitals and ambulatory care centers in New York City;
- a study of the possible impact of new medical technologies on the health care workforce;
- a synthesis of the findings from the several aspects of the study into this final report with recommendations for planners and policy makers.

2. Econometric Models

A critical element in this study that sets it apart from previous efforts is a series of econometric models designed to estimate the impact of a variety of factors on the health workforce in New York City. These models are much more detailed than those used in the earlier studies, and they provide insights about many individual health occupations and professions. Several models were developed, each dealing with a different aspects of the health system.

An empirical model of 74 Metropolitan Statistical Areas (MSAs) across the U.S. was developed to study likely changes in the hospital workforce in New York City (Appendix C). The model forecast overall bed losses and employment decline, and provided estimates of the number of RNs, LPNs, and other hospital workers that will be needed in New York City in the near future.

In addition, a series of empirical models were developed, one for each of the 22 professions and occupations examined in this study, based on data from hospitals and other health care organizations in New York City (Appendices D and E). These models estimated likely changes in employment for each profession and occupation in hospitals, ambulatory care clinics, and other health care organizations.

3. Structured Interviews

The computer models were supplemented by a series of structured interviews with CEOs and Human Resource Directors from a sample of hospitals and ambulatory care clinics in New York City (Appendix B). These interviews provide the latest insights about changes taking place in local facilities and about the attitudes of top administrators about the changes in health care organizations and financing now taking place. (Section VI)

4. Study of the Impact of New Technologies on the Health Care Workforce

A special study of the likely impact of new technologies on the workforce in health care organizations in New York City was also conducted. This exploration takes a longer term view and projects that many of the changes now beginning to occur as a result of technological innovations are likely to continue in the future. (Section VII and Appendix F.)

IV. HOSPITAL WORKFORCE PROJECTIONS FOR NEW YORK CITY

An extraordinary conjunction of organizational and financing innovations and incentives all but ensures that New York City hospitals will reduce dramatically their historically high inpatient use, and especially average lengths of stay. These innovations, including the state's deregulation of its long-standing hospital rate regulation system and increased competition among hospitals, insurers, and managed care organizations, have already resulted in significant reductions in the number of hospital bed-days in the City.

A. RECENT TRENDS

This downsizing has also begun to translate into reductions in the hospital workforce. Statistics for the third quarter of 1996 now available from the NYS Department of Labor show a loss of nearly 13,000 full-time and part-time healthcare jobs in New York City between 1994 and 1996, or nearly 6 percent of total hospital employment [5]. Translated into full time equivalent terms, this represents a decline of approximately 8,000 FTE workers.

Other organizations have also documented this decline. Data from the Greater New York Hospital Association (GNYHA), based on surveys conducted in February of 1995 and February of 1996, show a decline in employment at member hospitals of approximately 4 percent in one year (Table 3) [ ].

Recent tabulations by the United Hospital Fund report showed a significant and accelerating decline in hospital bed-days since 1994 (Figure 3). [9]. This same UHF report shows a six-month decline in hospital bed-days in New York City from 5.1 million to 4.1 million between 1992 and 1996. Of note is not only the total magnitude but the increase in the rate of decrease.

Despite these declines in hospital beds and employment, health care still accounts for some 370,000 full-time and part-time jobs in the New York City, or nearly 12 percent of the total workforce. And despite the shift from inpatient to ambulatory care now occurring in the City and elsewhere, hospitals continue to dominate the health care system, accounting for nearly 57 percent of health care employment in 1996 (Figure 2, page 17).

Data compiled by the NYS Department of Labor show that to date employment growth in other segments of the health care industry have more than offset the employment declines observed in hospitals. Ambulatory care and home care in particular have been growing significantly, although they represent a relatively small fraction of total health care employment. In addition, the mixes of workers employed in home care and ambulatory care are different than in hospitals.

Data from the American Hospital Association also confirm that hospital employment has begun to decline. Total FTE employment in New York City hospitals declined by 4,576 between 1993 and 1995 [7].

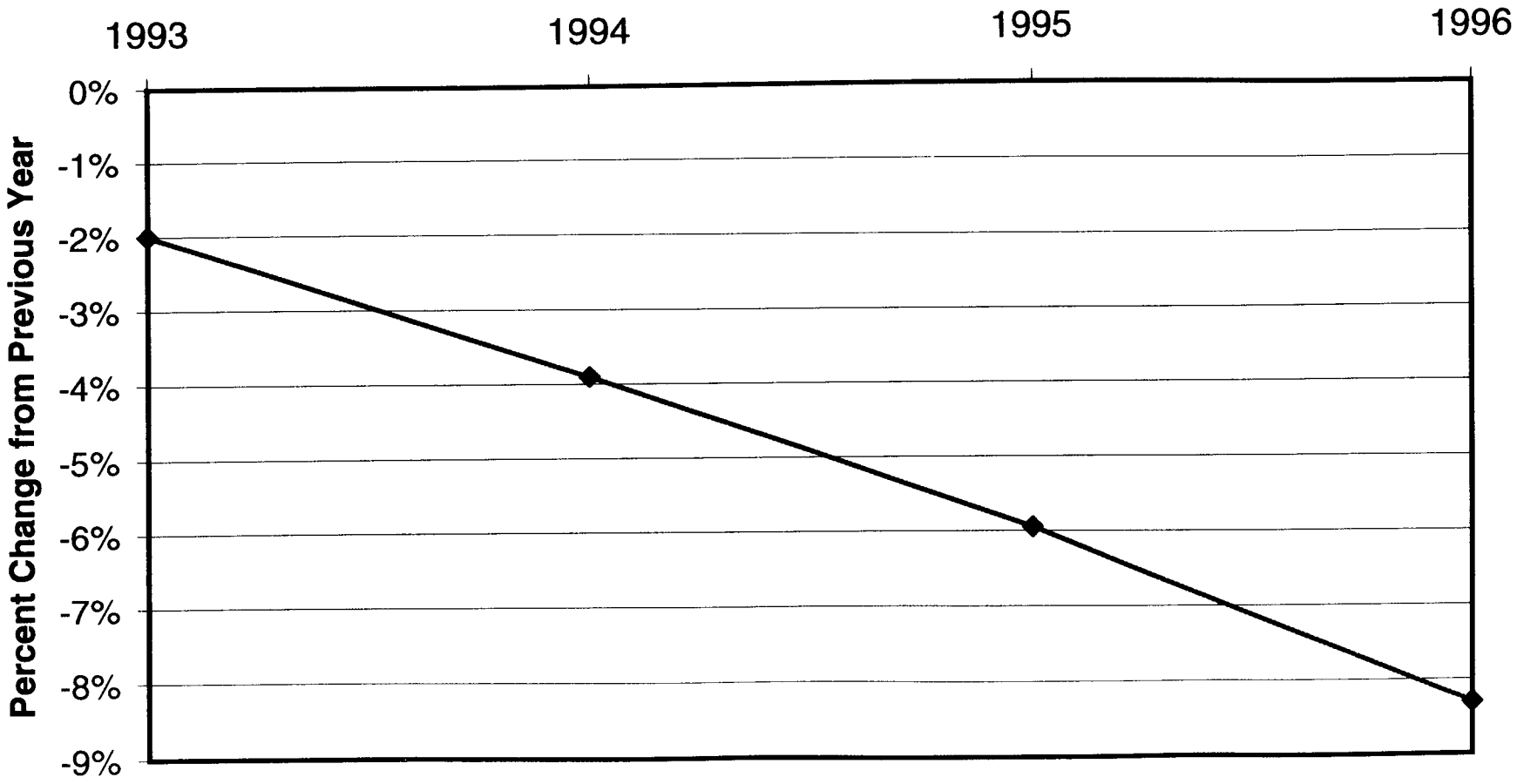
Data on worker layoffs in New York City hospitals also supports the observation of a decline in hospital employment. These figures, summarized in Table 4, show that more than 1,000 workers

Table 3. Change in Staffing Levels in GNYHA Hospitals By Job Category/Occupation, February 1995 to February 1996

Job Category/Occupation	# Hospitals Reporting	FTEs on February 1		Difference	
		1995	1996	#	%
Nurse		**37,722.7**	**36,657.5**	**-1,065.2**	**-2.8%**
Nurse Practitioner	32	343.6	368.5	24.9	7.2%
Nurse Anesthetist	23	114.7	118.3	3.6	3.1%
Nurse Midwife	15	81.1	85.8	4.7	5.8%
Nurse Clinician	26	501.7	469.3	-32.4	-6.5%
Registered Nurse	47	26,123.2	25,583.7	-539.5	-2.1%
Licensed Practical Nurse	46	2,286.5	2,254.1	-32.4	-1.4%
Nurse Aide	43	8,086.8	7,532.1	-554.7	-6.9%
Medical Assistant	15	185.1	245.7	60.6	32.7%
Medicine		**1,103.6**	**1,067.8**	**-35.8**	**-3.2%**
Physician Assistant	34	696.2	698.4	2.2	0.3%
Paramedic	13	257.6	238.1	-19.5	-7.6%
Emergency Medical Technician	11	149.8	131.3	-18.5	-12.3%
Therapists		**735.8**	**761.6**	**25.8**	**3.5%**
Physical Therapist	37	404.5	417.2	12.7	3.1%
Physical Therapy Assistant	24	67.4	66.6	-0.8	-1.2%
Physical Therapy Aide	20	60.7	65.7	5.0	8.2%
Occupational Therapist	30	187.8	196.7	8.9	4.7%
Occupational Therapy Assistant	11	15.4	15.4	0.0	0.0%
Counselors		**1,949.6**	**1,693.9**	**-255.7**	**-13.1%**
Social Worker (MSW)	43	1,464.7	1,308.1	-156.6	-10.7%
Social Worker	19	141.2	124.9	-16.3	-11.5%
Substance Abuse Counselor	24	343.7	260.9	-82.8	-24.1%
Ancillary Services Staff		**6,601.9**	**6,234.6**	**-367.3**	**-5.6%**
Medical Lab Technician	31	533.9	499.0	-34.9	-6.5%
Medical Lab Technologist	43	2,100.5	1,997.2	-103.3	-4.9%
Respiratory Therapist	38	815.5	714.2	-101.3	-12.4%
Respiratory Therapy Technician	25	134.7	125.3	-9.4	-7.0%
Pharmacist	44	1,022.5	970.4	-52.1	-5.1%
Pharmacy Technician	33	278.7	266.8	-11.9	-4.3%
Radiographer	11	199.1	150.3	-48.8	-24.5%
Radiology Technologist	29	655.7	646.1	-9.6	-1.5%
Radiation Therapy Technologist	21	137.5	155.0	17.5	12.7%
Nuclear Medicine Technologist	32	150.4	151.2	0.8	0.5%
Ultrasonographer	29	153.6	132.9	-20.7	-13.5%
Cardiac Perfusionist	12	62.5	61.0	-1.5	-2.4%
Blood Bank Technologist	22	201.6	209.6	8.0	4.0%
Cytotechnologist	19	61.8	77.9	16.1	26.1%
Speech Pathologist	28	93.9	77.7	-16.2	-17.3%
Support Staff		**2,250.3**	**1,957.4**	**-292.9**	**-13.0%**
Dietician	41	436.6	336.2	-100.4	-23.0%
Dietary Aide	39	1,813.7	1,621.2	-192.5	-10.6%
TOTAL		**50,363.9**	**48,372.8**	**-1,991.1**	**-4.0%**

Source: Greater NY Hospital Association

Figure 3. CHANGE IN HOSPITAL PATIENT DAYS
New York City, 1993 to 1996



Source: UHF Hospital Watch, 3/97

Table 4. LAYOFFS IN NEW YORK CITY HOSPITALS
1199 Union Positions, 1995 to 1997

Occupation/ Profession	1995	1996	1997 *	Total
Services	**244**	**196**	**27**	**467**
Housekeeping	88	48	19	**155**
Food Service	8	2	0	**10**
Maintenance	9	12	2	**23**
Nurse Aides, Orderlies, Etc.	139	134	6	**279**
Clerical	**67**	**111**	**28**	**206**
Clerks/Receptionists/Secretaries	59	106	27	**192**
Medical Records Techs/Admins	8	5	1	**14**
Technicians	**120**	**135**	**46**	**301**
Radiographer/Radiation Techs	10	14	4	**28**
Medical Technicians	25	26	6	**57**
Laboratory Technicians	7	32	16	**55**
Phlebotomists/IV Therapists	17	22	3	**42**
EKG Technicians	5	13	1	**19**
Pharmacists	1	7	2	**10**
Dieticians/Dietary Techs	55	21	14	**90**
Professional & Nursing	**20**	**48**	**3**	**71**
Registered Nurses	0	1	0	**1**
Licensed Practical Nurses	20	43	3	**66**
Physician Assistants	0	4	0	**4**
Therapists	**5**	**11**	**1**	**17**
Physical Therapists	2	0	0	**2**
Physical Therapy Assistants	0	1	0	**1**
Occupational Therapists	0	0	1	**1**
Occupational Terapy Assistants	0	0	0	**0**
Respiratory Therapists	3	10	0	**13**
Respiratory Therapy Assistants	0	0	0	**0**
Other	**30**	**60**	**4**	**94**
Social Workers/Counselors	26	20	3	**49**
Speech Therapists	1	0	0	**1**
Security Guards	0	27	0	**27**
All Other	3	13	1	**17**
TOTAL	**486**	**561**	**109**	**1,156**

* 1997 includes layoffs in January and February only.
Source: 1199 Union

1199 hospital workers were laid off between November 1994 and February 1997 [11]. It is likely that the number would have been much larger had there not been limitations on layoffs dictated by union contracts. In addition, because these figures include neither public hospitals nor management positions, they significantly underestimate the total number of layoffs.

B. FACTORS THAT COULD INFLUENCE THE EMPLOYMENT DECLINE

There are a great many factors that could affect the extent of the employment decline in the health care system in New York City. Some of the factors that could result in either increases or decreases in the health care workforce are summarized below.

1. Factors That Could Increase or Accelerate the Employment Decline

- Substantial cuts in Medicare and Medicaid, or major restrictions in eligibility for Medicaid programs;

- Acceleration of cost containment strategies, especially re-engineering of the health care workforce and outsourcing of support functions;

- Rapid introduction of for-profit health care into New York City, with the concomitant acceleration of cost containment strategies;

- Successful new pharmaceutical and technological innovations in health care that will reduce the incidence of illness and speed patient recovery.

2. Factors That Could Decrease or Decelerate the Employment Decline

Strong management reluctance to incorporate managed care concepts, either to avoid public relations problems related to layoffs and cutbacks, or to maintain current service levels despite high costs. This strategy carries both upside and downside risks. On the up side, it may help to avoid overshooting on cutbacks which could necessitate expensive re-commissioning and rehiring projects. It may also help to smooth out the rough spots in a turbulent restructuring process. On the down side, postponing downsizing may result in costs so high facilities cannot compete successfully for patients and managed care contracts. The interviews conducted as part of this study suggest that a minority of facilities are aggressively pursuing this strategy.

Relaxation of pressure from government agencies and the public for aggressive health care cost containment. Though possible, this scenario seems unlikely, especially in light of the fact that New York City hospitals are on average so much larger and more expensive than similar facilities across the United States.

Strong union resistance to cost cutting measures. Although union leaders are justifiably concerned that cost containment will result in job losses for their members, they are also aware that, if health care costs remain "excessively high," there are great risks of closures of facilities that could result in even greater job losses.

3. Other Factors Influencing the Decline

The speed of the introduction of the organizational and financing changes. For example, the impact on the workforce of a large reduction in Medicaid, all occurring in the same year, would be much more severe than the same reduction phased in over several years.

The responses by individual hospitals to the organizational and financing changes. Although most hospital administrators generally acknowledge the need for cost containment, many are loathe to cut programs before they have to. Downsizing too much runs the risk of unnecessary loss of market share for overly aggressive hospitals. It could also leave patients and communities under-served.

Delays in collecting and reporting data. Natural delays in reporting and processing data mean that policy makers must rely on anecdotes, personal contacts, and the media for insights about the latest changes and impacts. Major reporting delays could yield incorrect assessments of recent patterns and trends which could result in inappropriate choices and decisions.

Although any of these factors may actually come into play over the next several years, we believe it is more likely that the factors related to greater declines are more likely to win out in the current atmosphere of cost control that exists nationally and locally.

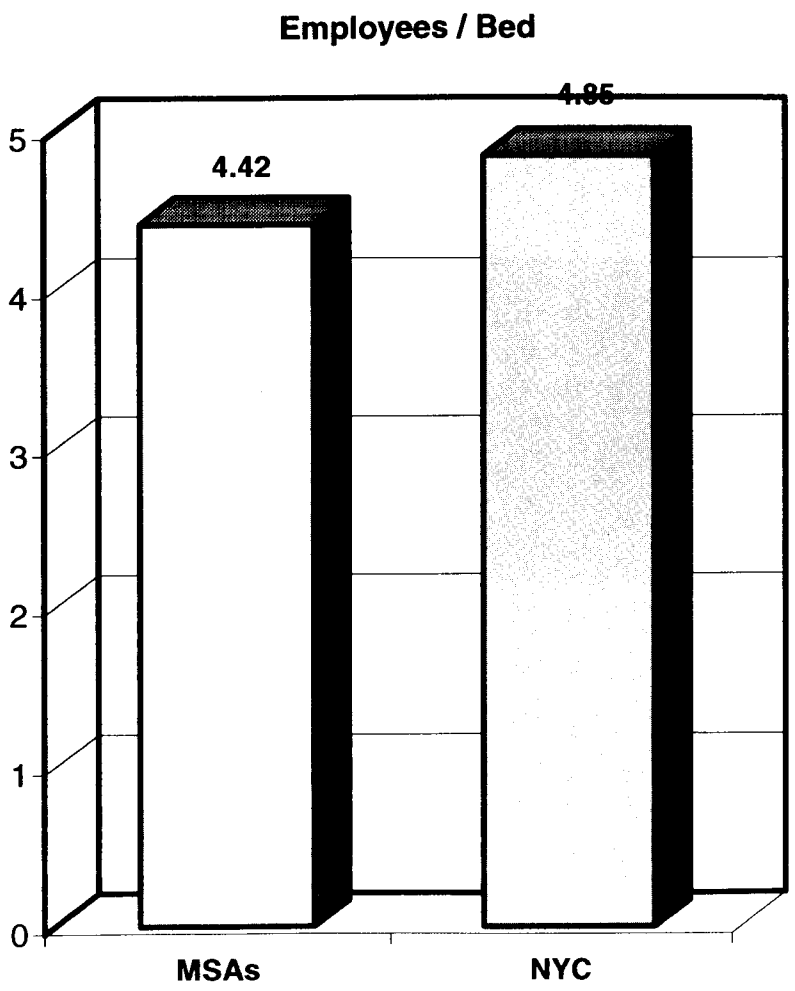
C. WORKFORCE ESTIMATES FOR HOSPITALS

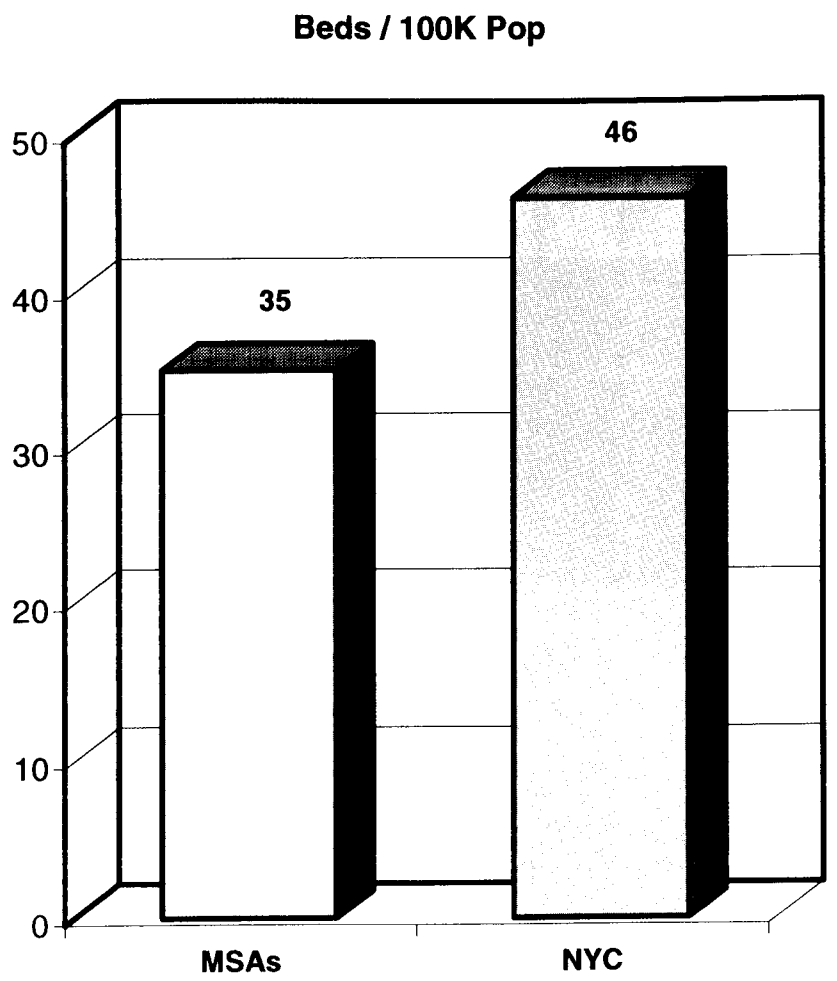
Any study of the health care workforce in New York City must begin with the hospital sector. Hospitals employed 210,000 full-time and part-time workers in 1996, more than the rest of the city's health services combined. The challenge facing planners and policy analysts today is to estimate the magnitude of the reductions in beds and employment that will occur over the next several years. Policy makers must then use this information to design training programs and other initiatives to minimize the dislocations for workers as the health care system changes. What if the hospitals in New York City move all the way to national averages for bed size and staffing patterns?

The potential impact can be estimated by assuming that the number of hospital beds per 100,000 population in New York City is reduced to the national average for 1994 (from 46 to 35), and that hospital employees per bed is simultaneously reduced to 1994 national levels (from 4.85 to 4.42). The basic numbers are presented in Figure 4. The combined effect of these changes would be a reduction in hospital workforce in New York City of 31 percent. This represents some 55,800 FTE workers, or nearly 70,000 full-time and part-time jobs.

Such a massive reduction would require (or would be driven by) equally massive changes in the health care system. It is not clear that the political systems in New York, Albany, and Washington would tolerate such a large change. On the other hand, the rest of the country is continuing a concerted effort to contain the costs of health care. By the year 2000, we would expect the 1994

Figure 4. Hospital Beds per Capita and Employees per Hospital Bed
New York City & 74 MSAs, 1994





Center for Health Workforce Studies, SUNY Albany

Source: AHA

averages in our target to be distant history, leaving even more ground for New York to make up in the quest for cost savings. And if New York were to reach for California levels, even for 1994, the impact on the hospital workforce would be much greater than even our worst care scenario.

Some hospital executives in New York City have been unofficially predicting staffing levels as low as 3.5 employees per bed. Combined with the reduction in beds per capita suggested in this straightforward analysis, this would result hospital workforce reductions of more than 45 percent (82,000 FTEs). We do not believe this will happen, but we do expect that continuing pressures to reduce health care costs will create continuing incentives to reduce the health care workforce beyond the "most likely" estimates developed in this study. The structural changes in health care delivery and financing required to "go all the way" seem totally beyond the current realm of possibility. Cost and employment reductions in New York City beyond our estimates, should they occur, will likely take place after the year 2000.

These figures are not presented simply to be sensational. It is important that planners and policy makers understand clearly the potential magnitude of the changes now beginning in the health care system. It is very difficult to predict such changes accurately, because there are many factors that will influence the trends in health care in New York City. But the general patterns and directions are very clear.

D. ECONOMETRIC MODELS FOR HOSPITALS

A series of econometric models were developed to analyze the experiences of 74 large metropolitan statistical areas (MSAs) around the country in order to understand the effect of changes in demographic factors, health care financing, and health care supply on hospital employment in New York City. These models also generate hospital employment and utilization forecasts for the City through the year 2000.

The models predict the following changes in hospital utilization and employment for the 1995 to 2000 time period:

- Annual hospital admissions will fall by 16 percent, or 182,000 admissions.
- Inpatient beds will be reduced by 32 percent, or 10,900 beds.
- Total hospital employment will decline by 18 percent, or 32,800 FTEs.
- RN employment will fall by 19 percent, or 6,850 FTEs.
- LPN employment will fall by 33 percent or 1,170 FTEs.
- Other hospital salaried employment (including nursing aides, orderlies, general office clerks, maids, and housekeepers) will decline by 18 percent or 25,410 FTEs.

The models use correlation and regression analysis to identify factors that are directly and indirectly related to five hospital occupational categories (total employees, physicians and dentists, registered nurses, licensed practical nurses, and all other employees). The factors used

in the analyses include demographic, health status, health care financing, managed care penetration, hospital ownership, facility supply, and physician supply variables for the 74 MSAs. Unlike other hospital employment forecasts that project exclusively with inpatient variables (e.g., admissions, average length of stay (ALOS), bed counts), our models also incorporate hospital ambulatory care services. Thus our analysis reflects the fact that some of the inpatient job losses are likely to be offset by growth in outpatient services.

The factors found to have the strongest direct effect on hospital utilization and employment were government per capita medical spending, ALOS, real family income, and the size of the foreign-born population. ALOS has the largest impact, but still explained less than half of the variations in utilization and employment across the 74 MSAs. The other variables contribute substantially less to the estimates.

The results of our models are generally consistent with recently observed hospital job losses in New York City. The forecast of total employment loss is somewhat larger than the actual job losses in 1995 an 1996, but it is consistent with an accelerating layoff trend as health care deregulation takes full effect this year. The RN projection is consistent with the 1,300 RN job losses recorded in 1995, and the forecasted decline in hospital LPNs is also consistent with recent employment trends, and a longer-term decline in hospital LPN employment of 35 percent over the 1989 to 1994 period.

Other findings from this segment of the study include:

- HMO penetration and concentration rates, per capita health and Medicaid spending, and the relative size of the local for-profit hospital sector do not *directly* affect hospital employment in our five employment categories.

- RN employment is closely associated with total hospital employment and other hospital employment across the 74 MSAs, and all three of these employment categories are strongly related to inpatient admissions, surgical operations, average daily census , and hospital beds.

- The number of population-adjusted emergency outpatient visits significantly affects all employment categories except LPNs.

- Hospitals employ a more constant ratio of RNs to inpatient beds compared to their employment of total workers. This implies that relatively fewer RNs are likely to laid off compared to other types of workers as hospital beds are reduced. On the other hand, hospitals will also employ relatively fewer RNs compared to other workers when non-emergency outpatient services increase.

- Hospitals employ LPNs more flexibly than they do RNs, but LPNs are at greater risk of layoffs than RNs or hospital workers in general when beds are reduced.

- Hospital use and employment are positively affected by the number of doctors in an MSA. A large number of doctors encourages hospital use and hence increases hospital

employment. This is more evidence that local and regional variables (including demographic and health services supply variables) must be carefully considered when assessing the impact of national trends (e.g., increasing managed care penetration) on local health care delivery and employment.

Additional insights about the models and the findings from our MSA analyses can be found in Appendix C.

V. PROJECTIONS FOR SPECIFIC HEALTH PROFESSIONS & OCCUPATIONS

A. OVERVIEW

Because of limitations in data resources, the employment forecasts in this study are generally stronger for hospitals than for other health care industries. Moreover, the study did not examine some health-related industries, such as retail pharmacies, that may become significant new employers of selected downsized hospital workers, such as pharmacy technicians. We did review employment patterns in the local pharmaceutical (SIC 283), medical instruments and supplies (SIC 384), ophthalmic goods (SIC 385), and electronic components and accessories manufacturing (SIC 367) industries. Based on our examination, we conclude that few opportunities will emerge in these small and locally-declining industries.

The New York City inter-industry health care occupational employment projections are summarized in Table 2 (page 9). Details for the hospital sector, which incorporate the results of the MSA models described in the previous section, are provided in Table 1 (page 7). These figures provide an overall estimate of the employment changes we expect in the health care industry in New York City between 1995 and 2000. These figures assume that New York will not shift all the way to national average levels of managed care and staffing reductions, which could result in larger reductions in hospital employment than those shown in Table 1. Our estimates also assume that many hospital administrators and policy makers will resist changes as large as could possibly happen and postpone responses to competition and managed care as long as possible.

The data shortcomings (shown by the many appearances of "not available" in the occupational projection summary tables below when the occupation could not be identified in the employment data sources used) mean that the projections probably underestimate employment growth opportunities in non-hospital health care industries. The study's conservative industry growth forecasts may also contribute to an understatement of new job opportunities for displaced hospital workers in other health care industries. In particular, the study may underestimate new opportunities for RNs, radiographers, clinical lab technicians, respiratory therapists and clerical workers. Nevertheless, we are confident that these possible omissions do not affect the direction of change set by the major hospital occupations. For example, the large decline in hospital RN employment will not be fully offset by growth elsewhere in the health care industry.

The hospital occupations analyzed in the study (not all of which are included in this summary) comprise about 75% of total hospital employment in New York City. The study concludes that net hospital employment in these occupations will decline by 25,400 full-time workers over the 1995-2000 period. This result is consistent with the estimate of a total decline of 32,800 workers in the hospital industry (including managers, supervisors, social workers and other occupations not covered by the study) obtained from our econometric models.

The review of new job opportunities in the ambulatory, home care and nursing home industries finds limited opportunities for displaced and retrained hospital workers in these health care sectors. Only three occupations are expected to grow by more than 1,000 new jobs in these industries over the five-year period: medical assistants, home health aides, and personal care

aides. The medical assistant occupation, described in more detail in the report text, offers excellent opportunities for retrained nurses' aides who are flexible, literate (with solid math and verbal skills) and possess good interpersonal skills. Unfortunately, we expect less than one medical assistant job opening for every six nurse aides displaced in hospitals and nursing homes over the next several years.

The other two high-growth non-hospital occupations, home health aides and personal aides, are low-paying occupations. Neither will provide many opportunities for the hospital workers we expect to lose their jobs, who will generally have greater skills and larger salary expectations than either of these two aide occupations.

Three additional occupations -- physical therapists, physical therapy assistants and medical records technicians -- offer good career opportunities (in terms of skills and pay) and are expected to grow significantly. But together they will create fewer than 1,000 new non-hospital jobs, and they require specialized, post-high school education (at least a bachelor's degree for the first and associate's degrees for the other two).

A number of professions and occupations should have opportunities to shift into other health care opportunities should they be laid off by hospitals. Clerical and administrative support workers possess skills useful in many situations, especially if they have computer experience and good interpersonal skills. RNs, LPNs, respiratory therapists, and radiographers possess solid health care skills that remain valuable in a growing health care industry, even if opportunities decline significantly in hospitals.

Prospects for some occupations, however, are not nearly as bright. Nurses' aides, food preparers, and housekeepers face an uncertain future. Many will be forced either to retrain for the relatively small number of technician and professional health care openings (requiring a large investment in formal education) or to seek opportunities outside of the health care industry, for example, in hotel and office building services. While both of these industries are now growing, they are highly cyclical, and displaced hospital workers will face stiff job competition.

B. GROWTH OCCUPATIONS

Although it is difficult to develop precise estimates of the growth of specific occupations, several professions and occupations are expected to grow between 1995 and 2000:

- **Home Health Aide.** Our estimate of the growth in this occupation in New York City is 2,570 FTE positions.

- **Personal Care Aide.** Our estimate of the growth in this occupation, which appears primarily in home care settings, in New York City is 1,230 FTE positions.

- **Medical Assistant.** Our estimate of the growth in this occupation in New York City is 1,090 FTE positions, 470 of which will be in hospitals.

- **Medical Records Technician.** Our estimate of the growth in this occupation in New York City is 290 FTE positions, 130 of which will be in hospitals.

- **Physical Therapist.** Our estimate of the growth in this profession in New York City is 270 FTE positions, the majority of which will be in physician offices.

- **Physical Therapy Assistant.** Our estimate of the growth in this profession in New York City is 200 FTE positions, the majority of which will be in physician offices.

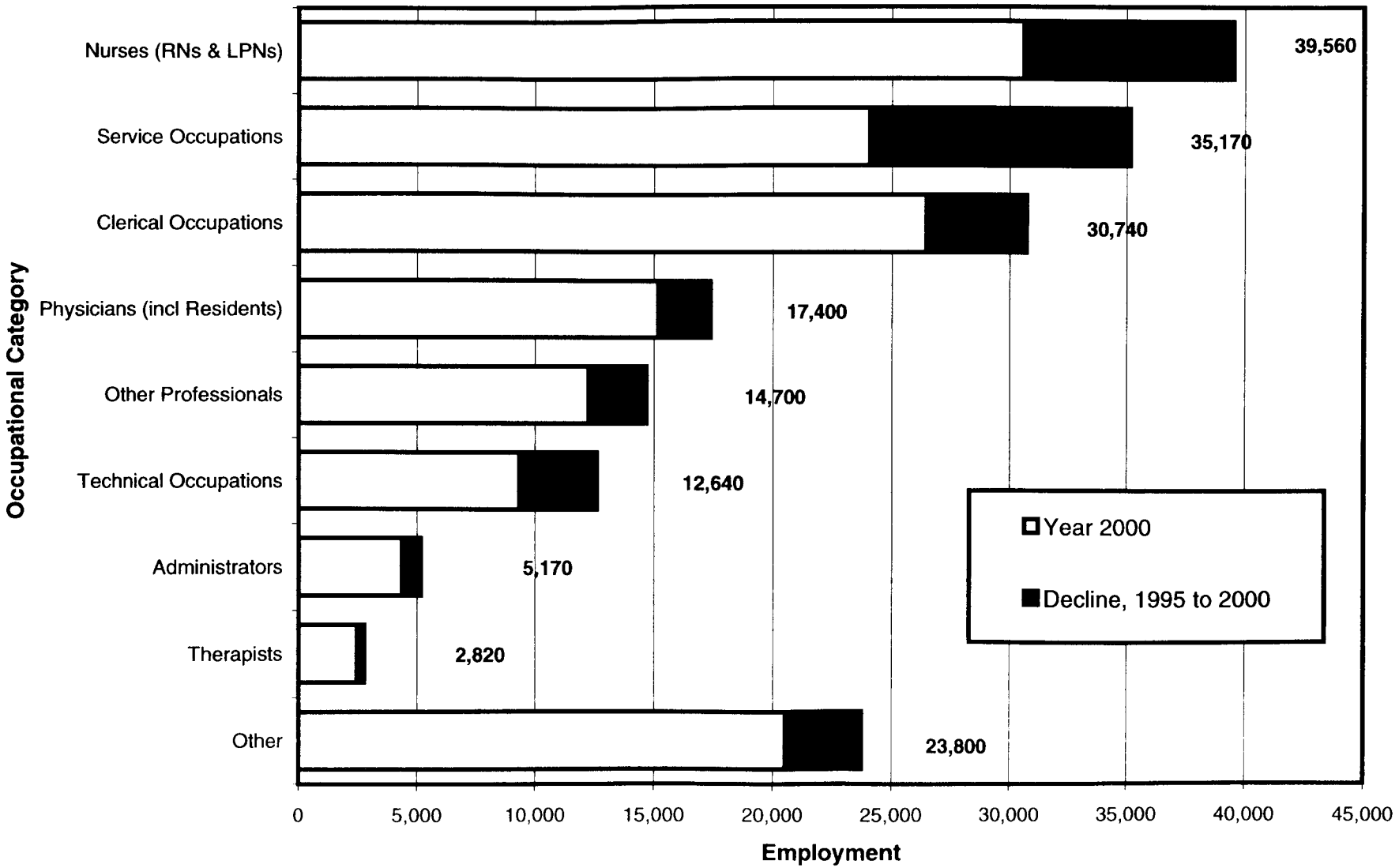
- **Occupational Therapist.** Our estimate of the growth in this profession in New York City is 80 FTE positions none of which will be in hospitals.

In addition to these seven professions and occupations, we expect continuing growth in the numbers of unlicensed "patient care assistants," especially in hospital settings. Because these occupations are so new, and because most of them are defined and trained locally in the individual hospitals in which they work, it is very difficult to estimate the magnitude of growth. We also expect growth in several other classes of ambulatory care workers, especially clerical and other support workers with multiple skills.

C. ASSESSMENTS FOR SPECIFIC OCCUPATIONS AND PROFESSIONS

We anticipate workforce reductions in all broad categories of health care workers in New York City between 1995 and 2000 (Figure 5). The pages that follow summarize our best assessments of the prospects for each of fourteen specific health occupations and professions in New York City. The assessments are based on a variety of different sources and analyses compiled and conducted as part of this study.

Figure 5. HOSPITAL EMPLOYMENT IN NEW YORK CITY
By Occupational Category, 1995 and 2000



1. Registered Nurse (RN)

RNs observe, assess, and record patient symptoms, reactions and progress; assist physicians during treatments and examinations, administer medications, assist in convalescence and rehabilitation; develop and manage nursing care plans; instruct patients and their families in proper care. They graduate from accredited nursing schools and pass a national licensing examination.

In the future RNs are expected to assume more supervisory functions in hospital, ambulatory clinic, home care, and managed care organization settings; performing more complex procedures in both hospital and home care settings (a sicker inpatient base and monitoring portable medical technology in home care settings). Employment prospects will be better for RNs holding a B.S. or a master's degree than for those trained at the associates degree or diploma level.

The total number of RNs employed in New York City in 1994 was 67,310. These nurses were employed in the following settings:

Hospitals	69%
Nursing and Personal Care Facilities	6%
Home Health Care Services	5%
Offices & Clinics of Physicians	4%
Business Services	3%
Social Services	3%
Other	10%

The projected total replacement openings (turnover) for RNs between 1995 and 2000 is expected to be 5,000. Projected growth in new openings over the same period by health care sector are:

Hospitals and Hospital-Owned Clinics	-6,850
D&TCs	+90
Physicians' Offices and Other Health Practitioners	+130
Home Health Care	+320
Nursing Homes	0
Net Change	**-6,310**

New job openings for RNs in other health service industries will not nearly suffice to replace the jobs lost to hospital downsizing between 1995 and 2000. However, given the size of the profession, RNs will still enjoy significant turnover opportunities. Furthermore, demand for RNs is likely to increase in non-hospital health services in the years beyond the forecast period.

Given the large oversupply problem that we expect to persist by the time newly-trained RNs enter the local labor market, **we recommend the Employment, Training and Job Security Program train no new RNs over the next three years.** However, RN supply and demand tends to be cyclical, so the program should monitor national and local training and employment trends closely for this important profession and be prepared to begin training programs in the period ahead.

2. Licensed Practical Nurse (LPN)

LPNs care for the sick, injured convalescing and handicapped under the direction of physicians and RNs. They provide basic bedside care, check vital signs, perform injections, dressings, alcohol rubs and catheter insertion; observe patients, collect samples for testing and perform routine laboratory tests. They help with patient dressing, feeding and personal hygiene and may supervise nurse aides. LPNs must complete a one-year training program and pass a state licensing exam.

In the future LPNs are expected to have more clerical and supervisory duties as employment shifts from hospitals to ambulatory, home care and nursing home settings.

The total number of LPNs employed in New York City in 1994 was approximately 20,000. These nurses were employed in the following settings:

Hospitals	39%
Nursing and Personal Care Facilities	28%
Home Health Care Services	9%
Offices & Clinics of Physicians	6%
Social Services	5%
Local Government (excluding education & hospitals)	4%
Other	9%

The projected total replacement openings (turnover) for LPNs between 1995 and 2000 is expected to be 2,000. Projected growth in new openings over the same period by health care sector are:

Hospitals and Hospital-Owned Clinics	-1,170
D&TCs	+50
Physicians' Offices and Other Health Practitioners	+80
Home Health Care	+160
Nursing Homes	+240
Net Change	**-640**

The supply of LPNs in New York City is projected to decline by about 1,500 by 2000, according to projections derived from the New York State Education Department survey of registrants. Although the LPN supply is expected to fall, turnover openings are significant and there will be growth openings in non-hospital health care. the New York State Department of Labor forecasts very slow growth for this profession out to 2005. Although there are some near-term placement opportunities for LPNs, **we recommend that the Employment, Training and Job Security Program train no new LPNs over the next three years**. This situation could change as positions are redefined by the health care industry, especially with regard to the new multi-skilled patient care workers. Therefore we urge careful monitoring of employment patterns so that the industry can respond quickly to any important new patterns.

3. Physician Assistant (PA)

Physician Assistants (PAs) are formally trained to provide routine diagnostic, therapeutic and preventive health care services under the direction and supervision of a physician. They take medical histories, examine patients, order and interpret lab tests and X-rays and make preliminary diagnoses. They also treat minor injuries, instruct and counsel patients, prescribe medications and manage health staff. Many PAs work in primary care practices; some specialize. Rigorous 4-year instruction programs are offered by four-year colleges and medical schools. Most applicants hold bachelor's or master's degrees. State certification and continuing education are required.

PA responsibilities will grow as hospitals substitute them and other professional non-physician providers (e.g., nurse practitioners and nurse midwives) for physicians. They are also likely to assume more supervisory responsibilities in primary care clinics.

The total number of PAs employed in New York City in 1994 was approximately 1,600. These professionals were employed in the following settings:

Hospitals	55%
Offices & Clinics of Physicians	28%
Offices & Clinics of Dentists	5%
Local Government (excluding education & hospitals)	5%
Other	7%

The projected total replacement openings (turnover) for PAs between 1995 and 2000 is expected to be 130. Projected growth in new openings over the same period by health care sector are:

Hospitals and Hospital-Owned Clinics	+250
D&TCs	+10
Physicians' Offices and Other Health Practitioners	n/a
Home Health Care	n/a
Nursing Homes	n/a
Net Change	**-260**

Although hospital employment of PAs grew 23% between 1989 and 1993, almost 30% of the 1996 GNYHA survey respondents reported difficulty filling PA positions, suggesting local supply remains inadequate. Some 15% of the respondents also reported planning to increase their PA employment by more than 10% in 1996-97. National data and local anecdotal evidence suggest PA employment in primary care clinics and group physician practices will also grow significantly over the forecast period and beyond, although more precise estimates are unavailable.

The Program is probably not in a position to influence the size of PA training programs in New York, which are already producing approximately 500 new PAs per year, and have far more qualified applicants than they can accept. The program may, however, be able to negotiate access to PA training programs for selected highly qualified displaced hospital workers in some occupations, including Respiratory therapy assistants and clinical lab technicians.

4. Medical Assistant (MA)

Medical Assistants (MAs) perform routine clinical and clerical tasks to keep the offices of health practitioners running smoothly. They answer phones, update and file medical records, schedule appointments, and handle correspondence, billing, and bookkeeping. Clinical tasks include taking routine patient measurements, recording vital signs, explaining treatment procedures to patients, preparing patients for examinations, collecting specimens, etc. They also purchase and maintain supplies and equipment, and organize waiting and examining rooms. MAs constantly interact with others and often handle several responsibilities at once. No formal training is required for MAs, but community college preparation is desirable, as is passing a national certification exam.

MA responsibilities are not expected to change significantly over the next several years, unless an oversupply raises demand for additional training.

The total number of MAs employed in New York City in 1994 was approximately 6,600. These workers were employed in the following settings:

Offices & Clinics of Physicians	74%
Offices & Clinics of Dentists	15%
Hospitals	6%
Other	5%

The projected total replacement openings (turnover) for MAs between 1995 and 2000 is expected to be 400. Projected growth in new openings over the same period by health care sector are:

Hospitals and Hospital-Owned Clinics	+470
D&TCs	+60
Physicians' Offices and Other Health Practitioners	+560
Home Health Care	n/a
Nursing Homes	n/a
Net Change	**+1,090**

Because Medical Assistant is one of the few rapidly growing health care occupations requiring relatively little formal training, oversupply is a potential problem. Although experienced, retrained hospital workers may have a competitive advantage for new positions, growth opportunities will absorb only one out of six displaced hospital and nursing home nurse aides over the next 3 years.

Although the New York City employment base for Medical Assistants is still relatively small, this occupation offers one of the best retraining opportunities for displaced hospital nursing assistants and nurse aides. Wary of possible near-term oversupply, we recommend that the Employment, Training and Job Security Program create retraining opportunities for 400 to 450 nursing assistants/attendants/aides over the next three years. Placement opportunities will be best in ambulatory clinics and private physician practices.

5. Medical Records Technician (MRT)

Medical Records Technicians (MRTs) assemble patient records, ensure that records are complete, and code for DRGs and other classifications (coding specialists). They use computers to tabulate and analyze data to improve patient care, monitor costs, prepare for legal actions, and respond to surveys. They may also supervise clerical staff. Educational requirements include completing an associate degree program and passing a national accreditation exam to become an Accredited Record Technician.

MRTs are expected to require additional database and statistical skills to handle new information systems and analyze data on patient care, costs, and quality of care. Lower-skilled functions (e.g., routine coding) will be increasingly automated.

The total number of MRTs employed in New York City in 1994 was approximately 1,900. These workers were employed in the following settings:

Hospitals	56%
Offices & Clinics of Physicians	17%
Nursing and Personal Care Facilities	8%
Social Services	7%
Health and Allied Services	7%
Federal Government	3%
Other	2%

The projected total replacement openings (turnover) for MAs between 1995 and 2000 is expected to be 400. Projected growth in new openings over the same period by health care sector are:

Hospitals and Hospital-Owned Clinics	+130
D&TCs	+50
Physicians' Offices and Other Health Practitioners	+80
Home Health Care	n/a
Nursing Homes	+40
Net Change	**+300**

We do not anticipate an oversupply of MRTs over the next three years. The occupation is relatively selective in that it requires meticulous attention to detail and strong math skills, which creates a significant educational barrier for many individuals.

The employment base for Medical Records Technicians is relatively small in New York City, but rapid growth is certain as integrated health delivery networks and managed care expand. **We recommend that the Employment, Training and Job Security Program retrain 150 to 200 displaced hospital records coders and clerks for the Medical Records Technician occupation over the next three years.** Hospitals will remain the largest source of both turnover and job growth, but there will be some shifts to clinics and ambulatory care sites.

6. Occupational Therapist (OT)

Occupational Therapists (OTs) help individuals with mentally, physically, developmentally, or emotionally disabling conditions to develop, recover, or maintain daily living and work skills. They also help to improve basic motor functions and reasoning abilities to compensate for permanent loss of function. OTs assist patients in performing activities of all kinds, ranging from dressing to using computers or special equipment to overcome disabilities. A bachelor's degree in Occupational Therapy is the minimum educational requirement, but a masters degree is preferred. A licensing exam must be passed before an OT can practice.

The total number of MAs employed in New York City in 1994 was approximately 1,700. These workers were employed in the following settings:

Hospitals	49%
Social Services	11%
Educational Services	11%
Nursing and Personal Care Facilities	7%
Health and Allied Services, NEC	5%
Local Government (excluding education & hospitals)	3%
Offices & Clinics of Other Practitioners	3%
Other	11%

The projected total replacement openings (turnover) for OTs between 1995 and 2000 is expected to be 160. Projected growth in new openings over the same period by health care sector are:

Hospitals and Hospital-Owned Clinics	0
D&TCs	+10
Physicians' Offices and Other Health Practitioners	+40
Home Health Care	+10
Nursing Homes	+20
Net Change	**+80**

Hospitals and nursing homes continue to report significant difficulties recruiting Occupational Therapists, suggesting there is no oversupply problem.

The occupational outlook for OTs appears to be strong with the New York State Department of Labor projecting growth in jobs of more than 3 percent per year. However, because their projection included an expected increase of nearly 500 hospital positions,, the DOL outlook must be tempered. Given all this, **we recommend that the Employment, Training and Job Security Program retrain 60 to 75 displaced hospital workers for Occupational Therapy positions over the next three years.** Hospitals will be the largest source of turnover jobs, but there will be opportunities in ambulatory care centers and private practices. Since student demand for OT programs is currently very high, this is another field in which special efforts could be made to negotiate access to existing OT training programs for selected highly qualified displaced hospital workers.

7. Occupational Therapy Assistant (COTA)

Certified Occupational Therapy Assistants (COTAs) help to plan therapeutic activities, observe patient responses and improvements and report them to the therapist, recommend changes in patients' home or work settings, conduct pre-vocational training according to therapists' plans, and teach patients how to cope with activities of daily living. This profession requires successful completion of a two-year associate degree program and passing a certification exam. COTA responsibilities are not expected to changeover the next several years.

The total number of COTAs employed in New York City in 1994 was approximately 465, which includes some lower-skilled Occupational Therapy Aides. These workers were employed in the following settings:

Hospitals	44%
Nursing and Personal Care Facilities	30%
Social Services	20%
Other	6%

The projected total replacement openings (turnover) for COTAs between 1995 and 2000 is expected to be 50. Projected growth in new openings over the same period by health care sector are:

Hospitals and Hospital-Owned Clinics	+0
D&TCs	n/a
Physicians' Offices and Other Health Practitioners	n/a
Home Health Care	+10
Nursing Homes	n/a
Net Change	**+10**

Both supply and demand are small for this tiny profession, but oversupply is always a potential problem when the employment base is so small and the profession is so new. However, nursing homes continue to report difficulties in recruiting COTAs, suggesting there is room to retrain a small number of new workers. On the other hand, many hospitals do not use COTAs at all, raising some questions about how many will be required in the future.

Given the small size of this profession and the uncertainty in the demand estimates, **we recommend that the Employment, Training and Job Security Program create retraining opportunities for up to 20 COTAs over the next three years.** This is another field in which special efforts could be made to negotiate access to existing COTA training programs for qualified displaced hospital workers.

8. Physical Therapist (PT)

Physical Therapists (PTs) improve mobility, relieve pain, and prevent or limit permanent physical disabilities of patients suffering from injuries or disease. They evaluate the patient, develop appropriate treatment plans, and delegate responsibilities to Physical Therapy Assistants and Aides. They use exercise, electrical stimulation, hot or cold compresses, ultrasound, deep-tissue massage, traction, and water therapy techniques. They also teach patients how to use crutches, prostheses, etc. A bachelor's or master's degree in Physical Therapy is required, and PTs must pass a licensing exam. The patient base and therapeutic techniques continue to change rapidly, and continuing education is essential in the PT profession.

The total number of PTs employed in New York City in 1994 was approximately 2,043. These workers were employed in the following settings:

Hospitals	34%
Offices of Other Health Practitioners	24%
Nursing and Personal Care Facilities	11%
Social Services	7%
Offices & Clinics of Physicians	7%
Health and Allied Services	6%
Home Health Care Services	3%
Other	8%

The projected total replacement openings (turnover) for PTs between 1995 and 2000 is expected to be 180. Projected growth in new openings over the same period by health care sector are:

Hospitals and Hospital-Owned Clinics	+30
D&TCs	+20
Physicians' Offices and Other Health Practitioners	+160
Home Health Care	20
Nursing Homes	40
Net Change	**+270**

Both the supply of and demand for Physical Therapists continue to grow rapidly nationwide, driven by medical advances that have extended rehabilitative therapies to a broader range of patients. The New York State Department of Labor expects local PT demand to remain strong until 2005. We expect demand will exceed supply well beyond 2000.

Although hospitals will continue to employ most PTs, relative growth will be greater in ambulatory care settings, particularly independent PT practices. Local trends show increasing substitutions of assistive personnel (e.g., Physical Therapy Assistants) for PTs in hospital settings, especially municipal hospitals. In light of this, **we recommend that the Employment, Training and Job Security Program create retraining opportunities for 130 to 150 PTs over the next three years.** This is another field in which special efforts could be made to negotiate access to existing professional training programs for qualified displaced hospital workers.

9. Physical Therapy Assistant (PTA)

Physical Therapy Assistants (PTAs) work along side Physical Therapists preparing patients for treatment and performing treatments to help patients to adapt to disabilities, improve mobility, relieve pain, and prevent or limit permanent physical disabilities resulting from injuries or disease. Treatments include exercise, electrical stimulation, hot or cold compresses, ultrasound, deep-tissue massage, traction, and water therapy techniques. They also instruct, motivate, and assist patients. A two-year associate degree is required, and PTAs must pass a licensing exam. The patient base and therapeutic techniques continue to change rapidly, and continuing education is essential in the PTA profession.

The total number of PTAs employed in New York City in 1994 was approximately 1,606. These workers were employed in the following settings:

Hospitals	35%
Offices of Other Health Practitioners	29%
Nursing and Personal Care Facilities	20%
Social Services	5%
Health and Allied Services	5%
Other	6%

The projected total replacement openings (turnover) for PTAs between 1995 and 2000 is expected to be 215. Projected growth in new openings over the same period by health care sector are:

Hospitals and Hospital-Owned Clinics	+30
D&TCs	+10
Physicians' Offices and Other Health Practitioners	+130
Home Health Care	10
Nursing Homes	20
Net Change	**+200**

Local demand for Physical Therapy Assistants continues to outstrip supply, and we expect it to continue to do so through 2000 and beyond. The New York State Department of Labor expects demand to grow faster than 3 percent per year until 2005.

Although the employment base remains small, job prospects are excellent for PTAs across the health care industry. While hospitals will continue to account for most turnover jobs, the Employment, Training and Job Security Program should target physician group practices and independent Physical Therapy Offices as the primary targets for new growth. In light of this, **we recommend that the Employment, Training and Job Security Program create opportunities for 110 to 130 nursing aides, LPNs, and selected technicians for retraining into the PTA profession over the next three years.** This is another field in which special efforts could be made to negotiate access to existing professional training programs for qualified displaced hospital workers.

10. Radiographer and Related Occupations

Radiographers and related technicians and technologists fall into two broad categories, those concerned with obtaining images of patient anatomical structures (Radiologic Technicians) and those concerned with administering doses of ionizing radiation to patients as part of prescribed treatment therapies (Radiation Therapy Technologists). Typically, the imaging technologies are used for a wide cross-section of patients as part of regular diagnostic services. The technologies used include X-ray, CAT, MRI, fluoroscope and sonogram equipment. The therapeutic technologies typically involve the use of high-energy linear accelerators, radioactive isotopes, and particle generators to treat very ill patients. A two-year associate program and licensing is required for most of these occupations. Background in math and science should be strong.

Anecdotal evidence suggests that as hospitals are cutting staff, technologists are increasingly assuming tasks typically handled by less-skilled technicians. At the same time very rapid innovations in imaging technologies require continuing training and education.

The total number of radiographers employed in New York City in 1994 was approximately 4,330. Of these, 2,260 were radiologic technicians (**RTs**), 1,720 were other radiologic personnel (**ORPs**), and about 350 were radiation therapy technologists (**RTTs**). About 3/4 of these workers were employed in hospitals, and another 20 percent were employed in physician offices.

The projected total replacement openings (turnover) for Radiographers between 1995 and 2000 is expected to be 325. Projected growth in new openings over the same period by health care sector are:

	RTs	ORPs	RTTs
Hospitals and Hospital-Owned Clinics	-200	-200	0
D&TCs	0	0	n/a
Physicians' Offices and Other Health Practitioners	+50	+30	n/a
Home Health Care	n/a	n/a	n/a
Nursing Homes	n/a	n/a	n/a
Net Change	**-150**	**-170**	n/a

The Bureau of Labor Statistics reports that the shortage of these positions that existed in the 1980s has now been transformed into a surplus that is likely to persist through 2005. New York City layoff data and the GNYHA survey show clearly an oversupply of hospital radiology technicians. Demand in hospitals for higher skilled technologists has been increasing, but the hospital downsizing will temper this trend in the future. We expect competition for jobs in these occupations to be fierce.

We recommend that the Employment, Training and Job Security Program retrain no new Radiologic Technicians over the next three years. We further recommend that the Program create opportunities for no more than 40 new Radiologic Technologists over the next three years. Downsized hospital Radiologic Technicians would be good candidates to participate in such training programs. Placement opportunities will best in private practices, diagnostic imaging centers, and outpatient cancer treatment facilities.

11. Respiratory Therapist and Respiratory Therapy Technician

Respiratory Therapists (RTs) evaluate, treat, and care for patients with breathing disorders. They measure lung capacity, analyze blood gases, use oxygen and medications to provide temporary relief, connect patients to ventilators, train home care patients how to use ventilators and other life support equipment, and perform chest physiotherapy to remove mucous from lungs. Respiratory Therapy Technicians perform many of the same tasks under the directions and supervision of a Respiratory Therapist. Respiratory Therapists require a two-year of four-year degree along with passage of a licensing exam.

Anecdotal evidence suggests that hospital RTs are expanding their scope of practice to include cardiopulmonary diagnostic procedures such as EKGs and stress testing.

The total number of RTs employed in New York City in 1994 was approximately 2,000, of which 20 percent were Technicians. Most of these workers were employed in hospitals.

The projected total replacement openings (turnover) for RTs between 1995 and 2000 is expected to be 160, with 140 of them in RT. Projected growth in new openings over the same period by health care sector are:

	RTs	RTTs
Hospitals and Hospital-Owned Clinics	-280	-70
D&TCs	0	0
Physicians' Offices and Other Health Practitioners	n/a	n/a
Home Health Care	n/a	n/a
Nursing Homes	n/a	n/a
Net Change	**-280**	**-70**

Although RT employment in New York City hospitals grew 16 percent between 1989 and 1993, we project an oversupply of both RTs and RTTs over the next several years. Both occupations are highly concentrated in acute care hospitals, and the reduction in numbers of beds along with earlier discharges will more than counteract any demographic or inpatient acuity trends favoring more hospital employment. Indeed, respondents to the latest GNYHA survey reported eliminating 101 FTE RT positions with no plans for future increases.

Prospects in hospitals for RTTs are even bleaker. There has been a steady decline in RTT employment since 1989, and there appears to be no prospects for increasing employment in the future.

There may be some small increases in employment for RTs and RTTs in nursing homes and home care services, but the employment in these sectors is far too small to absorb the reductions expected in hospitals. **We recommend training no new Respiratory Therapists or Respiratory Therapy Technicians between now and 2000.**

12. Medical and Clinical Lab Technologist and Technician

Medical and Clinical Lab Technologists and Technicians examine and analyze body fluids, tissues, and cells. They look for bacteria, parasites, and other microogranisms; analyze the chemical content of fluids; math blood for transfusions; and test for drug levels in the blood. They also prepare specimens for examination, count cells, and look for abnormal cells. They use automated equipment and instruments that perform many tests simultaneously, as well as microscopes, cell counters, and other kinds of laboratory equipment. They then analyze the results and relay them to physicians. Highly trained Technologists perform more complex procedures and supervise technicians and other laboratory personnel. Technologists require a B.S. degree, a year of clinical training at a professional school, and certification. Technicians, who perform routine tests under the supervision of a technologist, require an A.A.S. degree.

Several hospitals in New York City are investing in Total Laboratory Automation which is expected to reduce dramatically the demand for both Laboratory Technologists and Laboratory Technicians. This may also require specialty cross-training among those workers that remain. Those staff that remain are expected to assume more administrative and record-keeping tasks, and spend less time on clinical analysis.

The total number of MCLTs employed in New York City in 1994 was approximately 8,450, of which 5,100 were Technologists. These workers were employed in the following settings:

	Technologists	Technicians
Hospitals	75%	56%
Medical and Dental Laboratories	10%	9%
Offices & Clinics of Physicians	6%	13%
Health and Allied Services, NEC	4%	4%
Other	5%	18%

The projected total replacement openings (turnover) for MAs between 1995 and 2000 is expected to be 820. Projected growth in new openings over the same period by health care sector are:

	Technologists	Technicians
Hospitals and Hospital-Owned Clinics	-970	-700
D&TCs	+10	+10
Physicians' Offices and Other Health Practitioners	+10	+40
Home Health Care	n/a	n/a
Nursing Homes	n/a	n/a
Net Change	**-950**	**-650**

We expect the supply of both Technologists and Technicians to exceed demand out to 2000. Hospital automation will dramatically reduce job opportunities for both occupations. For this reason, **we recommend training no new Medical and Clinical Laboratory Technologists and Technicians between now and 2000.** Since these fields are changing rapidly, the Program should continue to monitor for new training opportunities in the future.

13. Billing Clerk

Billing Clerks compile and enter data and prepare invoices and bills, usually using specialized computer software. They must either know or learn billing and reimbursement procedures for different insurers, be familiar with medical terminology , and perform quantitative work meticulously. In smaller settings Billing Clerks may also perform general office tasks and collections, requiring effective interpersonal skills. Until recently, a high school education and on-the-job training has sufficed for employment, but community college or vocational school training is increasingly desirable.

As Billing Clerk employment declines in hospitals and increases in ambulatory settings, Billing Clerks will need broader training in different reimbursement systems and will assume a broader range of clerical and collection tasks.

The total number of Billing Clerks employed in New York City in 1994 was approximately 12,400. These workers were employed in the following settings:

Hospitals	9%
Offices of Other Health Practitioners	9%
Other	82%

The projected total replacement openings (turnover) for Billing Clerks between 1995 and 2000 is expected to be 350. Projected growth in new openings over the same period by health care sector are:

Hospitals and Hospital-Owned Clinics	-2,130
D&TCs	+100
Physicians' Offices and Other Health Practitioners	+200
Home Health Care	n/a
Nursing Homes	-80
Net Change	**-1,900**

The New York State Department of Labor projects a significant decline in the number of Billing Clerks between now and 2005. Despite this likely oversupply, we expect downsized hospital workers will be able to compete successfully for similar positions created by turnover and growth in ambulatory care settings.

In light of this, **we recommend that the Employment, Training and Job Security Program create opportunities for 75 to 100 nursing aides, LPNs, and selected technicians for retraining into Billing Clerk positions over the next three years.** This estimate is relatively small to reflect the current oversupply problem and the overlap that exists between Billing Clerks and Medical Assistants.

14. Medical Secretary

Medical Secretaries perform secretarial duties using specific knowledge of medical terminology and hospital, clinic, or laboratory procedures. Their duties include taking dictation and compiling and recording medical charts, reports, and correspondence using a word processor. In smaller ambulatory facilities, they may schedule appointments, answer the telephone, greet and direct visitors, and maintain files. They may also check insurance coverage eligibility and perform some billing tasks that require special knowledge. Formal education in a post-high school setting is desirable.

A relative shift in growth from hospital to ambulatory settings will favor employment of Medical Secretaries who are flexible and possess multiple skills as described above, including strong interpersonal skills.

The total number of Medical Secretaries employed in New York City in 1994 was approximately 6,180. These workers were employed in the following settings:

Offices and Clinics of Physicians	55%
Hospitals	21%
Offices and Clinics of Dentists	11%
Offices and Clinics of Other Practitioners	6%
Other	7%

The projected total replacement openings (turnover) for Medical Secretaries between 1995 and 2000 is expected to be 550. Projected growth in new openings over the same period by health care sector are:

Hospitals and Hospital-Owned Clinics	0
D&TCs	+80
Offices of Physician and Other Health Practitioners	+190
Home Health Care	n/a
Nursing Homes	n/a
Net Change	**+270**

Although hospital employment of Medical Secretaries increased 19 percent between 1989 and 1994, we expect total employment in hospital inpatient and outpatient settings to remain constant over the next several years. Our analysis shows that Medical Secretary employment is closely associated with hospital non-emergency outpatient visits (which are expected to grow between now and 2000).

We recommend that the Employment, Training and Job Security Program create opportunities to retrain 140 to 150 workers to become Medical Secretaries over the next three years. Placement opportunities for these workers will be best in offices of private practitioners.

VI. INTERVIEWS AT SELECTED HOSPITALS & AMBULATORY CARE UNITS

Structured interviews were conducted in late 1996 and early 1997 with administrators from a stratified sample of hospitals and other health care facilities across New York City. The interviews were structured to elicit information about organizational, operational, and environmental changes currently taking place and anticipated in the future. In addition to a series of open ended and specific questions, the interviews included a brief questionnaire requesting information about planned changes in employment for 20 different professions and occupations.

Four sets of interviews were conducted:

- CEOs and/or other executives at 10 voluntary hospitals;
- Human Resource Directors at the same 10 hospitals;
- Ambulatory Care Directors at the same 10 hospitals
- Directors of eight freestanding Diagnostic and Treatment Centers.

The interviews indicate that the reductions experienced in hospital employment over the past several years will accelerate in the near future as the health care system girds itself for the full-scale implementation of managed care and capitation contracts, with a transition to a much more competitive environment. The reductions are likely to be much larger than those experienced in 1995 and 1996.
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A. TRENDS

The interviews revealed a number of trends in health care delivery which influence the current and future workforce needs of the industry. The transformation from institution based service delivery to care delivered in the community continues. With the decrease in hospital inpatient days, there has been simultaneous increase in visits to hospital clinics and ambulatory care centers. Hospitals are expanding into the community with the development of more ambulatory care sites. Five hospitals reported developing off-site clinics at the rate of 2-3 per year. There is the intention to operate these clinics more independently from the hospitals and the desire to have them more closely resemble the personalized care delivered in a private doctor's office. Hospitals are also developing specialized centers of care such as birthing centers, substance abuse programs and sub-acute care units. Hospitals see a greater reliance on home health service and have expanded these programs at their institutions. Overall, there has been a steady and consistent shift in the locus of care from inpatient to outpatient; out of the institution and into the community. All hospitals expect this trend to continue well into the future. Consistent with this, diagnostic and treatment centers report an overall increase in their volume of visits within the last two years.

Other factors influence the delivery of care as well. Technological advances are leading to sweeping changes in certain services. Laboratory automation, innovations in radiology, computerization of medical records and patient tracking, accounting and other office functions, and communications technology will all have the ultimate effect of decreasing the number of workers required to fulfill these functions.

Finally, hospitals in New York are forming affiliations with other hospitals in the process of developing hospital networks and systems. The implications of this reconfiguration of the structure and face of the industry for the health care workforce are not yet fully recognized or understood. The potential impact bears further study. As a result of mergers, some hospitals are already reporting consolidation of certain services. Most expect that over time certain services or units will close.

B. HOSPITAL RESPONSES

Hospitals have responded in a variety of ways to the changes in their environment. Several hospitals reported efforts to restructure or re-engineer the way in which their services were organized and delivered. This has resulted in significant changes in the job responsibilities of many health care workers. Some hospitals utilized internal hospital committees to design the re-engineering process and to guide the decisions concerning the workforce. Other hospitals relied on outside consultants to initiate and structure a re-engineering process. This process goes by a number of names (re-engineering, restructuring, reorganization, consolidation, etc) but it is a continuous process, a work in progress, at nearly every institution. Organizational structures and the design of delivery systems will likely remain fluid as long as the environment in which the hospitals operate is changing. Hospitals are required to reinvent themselves to meet the changing times if they wish to survive and prosper.

The changes wrought by re-engineering efforts to date are varied and affect workers in a wide range of titles. While some hospitals have effected "across the board cuts" others have tried to cut with a finer scalpel and have, as a result, shut down floors or closed entire units or services. In the restructuring that is now underway, workers in general are being asked to assume a broader range of duties. Personal and professional flexibility is required and the acquisition of new or advanced skills is necessary. Nurses have assumed a wider variety of both clinical and managerial responsibilities. New patient focused care positions are being created under the titles of patient care assistant (PCA) and medical assistant (MA). These new hybrid positions combine clinical and clerical duties. Positions which combine the responsibility for medical records, financial and office management, and front desk duties are emerging.

All hospitals are in the throes of staff reductions in this era of downsizing and have already significantly decreased their workforce. Reductions have been accomplished through a variety of means. Attrition, early retirement incentives, reassignment to other departments or other sites, and hiring freezes are all considered desirable alternatives to layoffs. Hospitals hope to accomplish most downsizing through attrition and maximizing early retirement options if at all possible. Contractual obligations with unions were cited as preventing the optimal use of reassignment of staff. Some hospitals have had layoffs but view this as a last resort.

A number of hospitals have begun to explore the possibility of contracting out, or outsourcing, for certain services. Some of the services identified as possibly lending themselves to outsourcing include housekeeping, dietary, laundry, pharmacy, laboratory, transportation, transcription services, garage, food service, and maintenance. Although there is significant interest in the use

of outsourcing, few hospitals are currently using this approach. Restrictions imposed by union contracts were cited as the predominant obstacle to more aggressively pursuing outsourcing as an option.

All hospitals report using part-time workers to supplement their full-time workforce. This allows staffing flexibility to meet increased demand at peak times and for weekend and night coverage. The benefit of part-time workers is that they provide a supplementary or contingency workforce while diminishing the need to pay full-time workers time and a half for overtime.

C. THE FUTURE

As the face of the workforce changes, there will be an increased demand for some titles and occupations and less of a need for others. It is projected that there will be an increase in the use of nurse practitioners, home health nurses, physician assistants, and physical therapists. There will be decreased demand for RN's as direct care givers but an increase in the use of nurses as managers, supervisors, and patient educators. There will likely be a decrease in the use of LPN's, nurse aides, support staff, laboratory and radiology technicians, pharmacists and pharmacy aides, and clerical workers. Executive staff and middle management are also vulnerable and likely to be affected by staffing cuts and downsizing. All hospitals expect a decrease in the number of medical residents. They expect that care that has been traditionally provided by the residents will, in the future, be rendered by physician assistants or nurse practitioners.

At the interviews the Human Resource Directors were asked to indicate on a brief survey which occupations and professions are likely to increase and decrease over the next two years. Table 5 summarizes the responses for the eight respondents. The data show clearly that some occupations will decline at all or most hospitals, some will increase at most hospitals, and some (e.g., LPNs) will be treated differently by different facilities.

The changes that are occurring in the size, nature and configuration of the workforce have significant implications for the training needs of hospitals and other health care facilities. The interviewees all expect continued growth in the provision of home health care and ambulatory care. All agreed that health care workers who remain in the hospital setting as well as those who work off-site in community clinics will be required to possess a broader and more sophisticated mix of skills. Workers with a single skill are vulnerable and are being replaced by those who are multi-skilled. The specific skills required of health care workforce of tomorrow depend, of course, on individual job titles and responsibilities. However, there is a consensus that the overall skill level of the least skilled workers needs to be raised. The skills that are certain to be needed include: computer literacy; customer relations and interpersonal skills; language fluency to meet the cultural diversity of New York's population; expertise in medical terminology and coding; and basic literacy in English. The new patient care assistants will require clinical skills in EKG and phlebotomy. Nurses and physician assistants will require patient education skills and training in the utilization of clinical pathways and treatment protocols. An understanding and the appropriate application of the principles of managed care will demand education and training to develop the skills of those who perform overall patient management. Patient triage and telephone assessments need to be refined. There is a need to develop organizational skills and increase the

Table 5. EXPECTATIONS FOR HOSPITAL EMPLOYMENT OVER THE NEXT TWO YEARS
Based on Responses of a Random Sample of Eight Human Resource Directors

PROFESSION OR OCCUPATION	DECREASE			Stay the Same	INCREASE			N/A
	Significant >20%	Moderate 10 - 19%	Limited 1 - 9%		Limited 1 - 9%	Moderate 10 - 19%	Significant >20%	
Nursing								
Clinical Nurse Specialist	I		I	II		II		II
Nurse Practitioner				I	III	IIII		
Nurse Midwife					II	IIII		II
Registered Nurse (BSN)	I	II	III	II				
Registered Nurse (AAS)	I	IIII	I	II				
Licensed Practical Nurse	I	I	II		II	II		
Nurse Aide	II	II	II	II				
Patient Care Assistant (Multi-Skilled)				I	III	III	I	
Medicine								
Staff Physician		I	I	I	II	I	I	
Intern & Resident		IIII	II			I		
Physician Assistant			I	I	III	III		
Therapist								
Physical Therapist				III	III	II		
Occuaptional Therapist				IIII	III	II		
Therapy Assistant			I	III	II	II		
Therapy Aide			I	III	II	II		
Ancillary Services Staff								
Laboratory Technician	IIII		I	I	II			
Radiologic Technician		III	I	III	I			
Pharmacist	I	I		IIII	II			
Pharmacy Assistant		I	I	II	IIII			
Support Staff								
Housekeeping	I	II	II	III				
Food Service	I	III	III	I				
Maintenance		I	III	IIII				
Laundry	I	III	I	III				
Clerical/Secretarial		II	II	IIII				
Patient Support Associate (Multi-skilled)			I	II	IIIII			
Clerical/Business Associate (Multi-skilled)		I	I	II	II	II		

Compiled by Center for Health Workforce Studies, SUNY School of Public Health.

administrative ability and capacity of staff in managerial or supervisory positions.

The personal characteristics that are desired are equally important. Flexibility, adaptability to ambulatory care settings, willingness to learn new skills and assume new responsibilities, problem solving skills, critical thinking, cultural sensitivity, and a strong work ethic are all highly prized.

There is clearly a need for training at all levels of the hospital workforce. Some hospitals report having developed in-house training capacity for some titles and functions. Other hospitals cite the lack of sufficient resources, space, and expertise to carry out in-house training. Hospitals rely on both the 1199/Hospital League Training Fund and training resources of the Greater New York Hospital Association (GNYHA) for training assistance. The emergence of health systems and networks also holds potential promise for the development of "in-system" training programs which offer economies and efficiencies of scale.

VII. AN ASSESSMENT OF THE IMPACT OF NEW TECHNOLOGIES ON THE HEALTH CARE WORKFORCE

Since World War II, the pace of medical technology innovation has accelerated dramatically. Major advances in technologies for imaging, surgery, cancer treatment, cardiac care, the treatment of chronic illnesses such as diabetes, and other areas have poured from laboratories into standard practice at hospitals throughout the United States. These technologies have greatly improved public health and significantly lengthened the average American's life span.

Health care technologies now entering the market stress outpatient care, labor-saving shortcuts and enhanced communication. Providers, feeling an urgent need to rationalize their institutions in preparation for a day of free-market competition, are carefully weighing investments in high-priced diagnosis and treatment technologies. Technology investment has shifted to systems or devices that give the purchaser a competitive cost advantage, help facilitate the shift from inpatient to outpatient treatment, emphasize preventive care, and enable lower-cost diagnosis and treatment options. Among the most significant new health care technologies are Information Systems, Hospital Services Automation, Portable Medical Devices and Telemedicine, and Ambulatory Care Surgery and Imaging Technologies.

A. INFORMATION SYSTEMS

The most important single technological development affecting the health care industry in recent years is the rapid evolution of electronic information systems. These include patient record systems, decision support or expert systems, and managed care information systems. Health care providers, especially hospitals, perceive information systems as essential to improving efficiency, containing facility costs and competing successfully for health care dollars in an increasingly market-oriented industry.

Until recently, hospitals concentrated their information system investments in such service departments as finance, patient care, the laboratory and the pharmacy. Today, driven by cost pressures and explicit managed care organization (MCO) demands, hospitals are investing in information systems that extend far beyond the departmental level. Cutting-edge information systems focus on entire facilities and even integrated networks of facilities, often linking the patient's bed side with a network-wide information system.

Information system upgrades have substantial employment and skills implications, although the literature almost never discusses them. Hospital decision-support and patient-record systems are expected to increase nursing staff productivity and reduce nursing unit staff-to-patient ratios. These systems allow professional skills to be broken down into discrete, standardized "tasks" that are then assigned to retrained (upskilled) nursing and therapeutic assistive personnel.

B. HOSPITAL SERVICE AUTOMATION

Hospital service departments such as the laboratory and pharmacy have long used specialized information systems for inventory control and record keeping. But several New York hospitals

are now adopting new clinical laboratory and pharmacy systems that go beyond these functions and include robotics, automatic measuring instrumentation, and integrated, computerized information systems. Total Laboratory Automation (TLA) is among these new systems and has potential to dramatically change the employment picture — in terms of both numbers and skills mix — in the hospital laboratory field.

The potential employment impact of automated pharmacy systems is less clear since TLA systems are likely to be implemented in only the largest of mail-order and institutional pharmacies. Automation of hotel-type services within hospitals can be expected to reduce employment of a wide spectrum of service employees and accelerate the cross-training and broad banding of traditionally distinct housekeeping, dietary, and laundry workers.

C. PORTABLE MEDICAL DEVICES AND TELEMEDICINE

A wide variety of technological innovations, coupled with growing ranks of home-based post acute and chronic care patients, are contributing to the phenomenal recent growth in home-based health treatment and employment. The widening scope of medical devices which can be deployed in an outpatient setting will enable providers to substitute lower-cost home care employees for higher-cost hospital employees. But the substitution will not be on a one-to-one basis: patients and their families can operate many of these devices.

In addition, telemedicine, which enables electronic linking of two or more health care sites, has far-reaching implications for shifting clinical services out of the hospital. Thus far, it appears that it will mainly impact physicians in terms of employment. For non-physician occupations, telemedicine is being used to boost worker productivity — by eliminating paperwork and travel time — but its effect on overall non-physician employment numbers has not been quantified. However, increased use of sophisticated treatment and monitoring devices does suggest upskilling of home health aides and nursing aides.

D. AMBULATORY CARE SURGERY AND IMAGING

In ambulatory diagnosis and treatment, a number of technological developments have abetted the sector's growth, including refinements in anesthesia, drug therapy, imaging devices, surgical invasive techniques and communications systems, all of which permit more precise and limited treatment and quicker patient recovery and mobility.

Each new "ambulated" procedure will cause a corresponding employment shift to outpatient care. The actual occupational significance depends on this sector's employment base — which is small relative to the hospital sector. Thus, the shift in employment of surgical technicians, radiological technicians, cardiology technologists and operating room nurses does not present a major opportunity. Except for radiological technologists and technicians, ambulatory employment of these technical occupations is still tiny compared to hospital employment and is likely to remain so for years to come.

E. THE IMPACT ON EMPLOYMENT

It is very difficult to estimate the impact of these kinds of new technologies on employment. The impact of new systems and equipment often depends more on the systems and procedures being replaced than on the new system. Rough estimates of the technologies described above are provided in Table 6. Although a few occupations and professions stand to gain from these innovations, it is clear that most of the *employment* impacts will be negative, especially in hospitals. This is not to suggest that the overall impact of the new technologies will be negative, only that they are likely to reduce employment along with other benefits they bring to health care.

Table 6. ESTIMATED IMPACT OF NEW TECHNOLOGIES ON THE HEALTH CARE WORKFORCE

PROFESSION/OCCUPATION	Hospitals						Home Care		Offices and Clinics	
	Total Laboratory Automation	Automated Pharmacy Systems	Telemedicine	Portable Medical Devices	Non-Inv. Treatments & Imaging	Information Systems	Telemedicine	Portable Medical Devices	Non-Inv. Treatments & Imaging	Information Systems
RNs			▼	▼	▼	▼	▲	▲	▲	▲
LPNs			▼	▼	▼	▼	▲	▲	▲	▲
Nurse Aides & Orderlies			▼	▼			▲	▲		
Therapists			▼	▼			▲	▲		
Therapy Assistants			▼	▼		▲	▲	▲		
Pharmacists		▼								
Pharmacy Technicians		▼								
Pharmacy Technologists		▼								
Clinical Lab Technicians	▼									
Clinical Lab Technologists	▼									
Home Health Aides							▲	▲		
Patient Associates (multi-skilled)						▲				
Surgical Technicians					▼				▲	
Radiology Technicians					▼				▲	
EKG Technicians					▼				▲	
Clerks					▼	▼			▲	▲
Medical Assistants									▲	
Medical Records Technicians						▲				▲
Financial/Medical/Health Managers						▲				▲
Marketing Managers						▲				▲
Systems Analysts/Programmers						▲				▲

Source: New Century Concepts, LLC

VIII. ONGOING WORKFORCE DATA COLLECTION

This study, as studies before it, was constrained by a lack of critical data on the health workforce. While there are some valuable sources of data, there are major gaps and inconsistencies. The recent decision by the American Hospital Association to reduce the workforce data they annually collect from hospitals will make detailed analysis even more difficult in the future.

In this period of transition, current data on employment and workforce supply trends is particularly important. Decisions must be made by health care facilities, unions, and government agencies on how to invest education and training resources. In addition, educational institutions and thousands of workers, students and prospective students must make decisions on their education programs and career choices. Timely data and information is critical to prevent major surpluses and major shortages which have enormous human and institutional costs.

A health workforce system can be established in New York City for a modest investment. This system would build on existing data collection and include the development of selected indicators and benchmarks. **We recommend that an Ad-Hoc Committee on Health Workforce Data and Monitoring be established with representation form labor and management and the health policy community**. This Ad-Hoc Committee would oversee the development of the workforce monitoring and tracking system.

A. PROBLEMS AND SHORTCOMINGS OF EXISTING SOURCES OF DATA

One of the challenges of this study has been compiling data to support the various models and analyses. Although considerable data exist in a number of sources, few of the sources use comparable definitions and time frames (See Appendix 1). A particularly vexing problem in this period of changing trends and patterns are the lags and delays in the data files. Most data collection processes related to employment have delays of up to three years in their standard tabulations and publications. These delays, which are related to normal collection, processing, editing, and publication activities, make it difficult to determine whether historical trends are continuing, reversing, accelerating, or stabilizing.

Another limitation in current data collection is related to the level of detail and the taxonomies used in the collection efforts. For example, it was unfortunate that the AHA chose to eliminate virtually all occupational details from their regular employment collections. This means that the models used in this study to estimate the changes in employment in specific occupations will no longer be possible using AHA data. Comparisons across regions in the country of MSAs will also be more difficult.

B. AN OVERVIEW OF A POSSIBLE ONGOING WORKFORCE MONITORING SYSTEM

The recommended health workforce tracking system would rely on several existing sources of data and a regular survey of selected health facilities.

1. Current sources of data to be tapped

♦ Department of Labor data on monthly employment (paychecks) by type of setting (such as hospitals, nursing homes, etc);

♦ The American Hospital Association annual statistics on operations and employment;

♦ Annual cost reports to the state Health Department;

♦ The United Hospital Fund's *Hospital Watch*;

♦ The annual Greater New York Hospital Association survey of employment; and

♦ Labor union data on layoffs.

2. Proposed data types

♦ A quarterly report from a sample of health facilities on hiring, layoffs, and voluntary departures and payroll. This would provide a set of indicators of current trends in employment.

♦ An annual survey of health professions education programs on new enrollment and graduations.

♦ Data on layoffs of specific professions and occupations in individual hospitals and other health care organizations, preferably not limited just to union workers. Layoff data on a quarterly basis would be very useful for tracking short-term trends.

♦ Data on total employment by occupation and profession in all hospitals and other health care organizations. The Department of Labor tabulations of jobs based on paychecks are especially useful because they gather data from all types of health care organizations on a monthly basis. One drawback , however, is that as health care networks develop, it is not clear that the Department of Labor data will adequately measure employment shifts between settings.

♦ Data on employment and other operating parameters (e.g., beds, daily census, length of stay, discharges) in hospitals now collected by the American Hospital Association, the Greater New York Hospital Association, the United Hospital Fund, and the New York State Department of Health are especially important data items. Ideally the occupational taxonomies used in the employment tabulations can be relatively detailed so that the training implications can be monitored closely.

♦ Data for nursing homes, ambulatory care facilities, home care organizations will become increasingly important as health care reforms proceed. The Department of Labor does collect data from these organizations, but their sampling strategies undercut the completeness and accuracy of the data.

In all cases the faster the data can be processed and made available to policy analysts the sooner can the latest trends be revealed. Fast turnaround will also increase the effectiveness of efforts to monitor the impact of training programs, new union contracts, government initiatives, new technologies, and other external factors on employment patterns and trends.

If complete files can be created over a several-year period it may be possible to conduct a study to identify reliable leading indicators of employment patterns and trends. Such a study might reveal whether patient census or bed counts are more important determinants of employment levels. Careful study might reveal the decision mechanisms that affect employment patterns in the health care system.

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APPENDIX A: DATA SOURCES

There are several basic sources of health workforce data relevant to this study: the Bureau of Labor Statistics (BLS), the American Hospital Association (AHA), the Institutional Cost Reports collected by the NYS Department of Health (ICR), and files from the Greater New York Hospital Association. All four organizations regularly collect and compile data on the health care workforce that can be summarized for New York City. It is important to understand that the workforce statistics compiled by these organizations are based on different definitions that yield markedly different numbers:

The AHA statistics are estimated Full-Time-Equivalent workers that combine full-time and part-time workers into a single FTE count. These data have been collected regularly for many years. Unfortunately, the AHA changed the occupational categories in 1994, opting for a much less detailed taxonomy that will undercut studies of this type in the future.

The BLS statistics are based on counts of paychecks with no distinction about who was paid. Because a person who holds a full-time job in one organization and a part-time job in another is counted as two workers in the BLS files, the BLS counts are much larger than the AHA FTE counts. The BLS data are also shared with the NYS Department of Labor.

The ICR statistics are based on FTE estimates much the same as the AHA estimates. These data are of interest primarily because they include tabulations for a number of occupations not separately identified in the AHA statistics.

In addition to these differences, there are also differences in the categories of workers maintained by the three systems.

Although prior to 1994 the AHA collected data from hospitals on more than 20 different personnel categories, since 1994 their collection has developed separate totals for only RNs, LPNs, and a few other broad categories of workers.

Although BLS does collect data for a number of general categories of workers (e.g., clerical staff), their published tabulations emphasize type of employer establishment (e.g., hospital, physician office).

The ICR data does include breakouts for some categories of workers, but these categories do not match well with those used by the BLS. Generally, the ICR data provides more detail for administrative and clerical titles than does AHA.

There is nothing inherently wrong with any of these approaches to counting the health care workforce. The important fact is that they yield different results. The differences between the paycheck statistics of BLS and the FTE estimates of AHA and ICR are substantial. For example, AHA statistics show that hospital employment in New York City in 1993 was 182,000 while the BLS statistics for the same year show nearly 220,000 workers, a 20 percent difference.

None of the data sources provide details about the workforce in home care and nursing homes required for the models developed in this study. Data on hospital-operated clinics and physician offices are even less adequate.

Another source of confusion is related to the public hospitals run by the NYC Health and Hospitals Corporation (HHC). These facilities employ nearly 60,000 workers. Because HHC is currently in a very difficult period, with discussions of privatizing the entire organization, their status and their statistics are more volatile. Although HHC has been included in this study, we have not made a special effort to develop separate estimates and projections for HHC facilities (except in the hospital statistical analysis).
In consideration of these situations, this study deals primarily with the AHA data for voluntary (not-for-profit) hospitals. Other data sets have been used for sectors other than hospitals as needed.