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Long-term care staffing needs for older people in Ohio

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Ohio Long-Term Care Research Project

LONG-TERM CARE STAFFING NEEDS FOR OLDER PEOPLE IN OHIO

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February 1998

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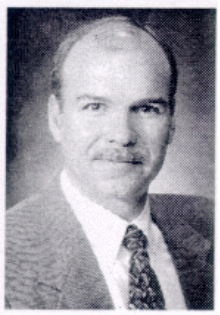

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Abstract

This study of long-term care staffing needs in Ohio used data from the Ohio Department of Health's 1993 Annual Survey of Long-term Care Facilities, Online Survey Certification and Reporting from the Health Care Financing Administration, and the National Long-Term Care Survey to examine current staffing levels in long-term care. Population and disability projections from the Scripps Gerontology Center and estimates of increasing acuity were used to project staffing needs to 2010.

Currently, institution-based long-term care in Ohio employs between 72,422 and 89,222 employees. Recent trends suggest that increasing acuity of patients will annually increase staffing needs for direct patient care by .71 full-time equivalent employees per 100 patients. Without any increase in the number of patients, this increased acuity will generate a need for nearly 9,000 additional staff by the year 2010.

Excluding medical specialists, home-based care for Ohio's disabled older people employed approximately 175,000 people in 1995. While the in-home older population is expected to increase by only 2.5 percent between 1995 and 2010, the disability level of the population is predicted to increase and the need for paid help is projected to increase by 17 percent. This implies that approximately 15,000 additional full-time equivalent staff will be required to provide home-based care by the year 2010.

Numerous factors will influence the growth in staffing needs by the year 2010. For several reasons, the projected growth presented in this report is considered a conservative estimate. These estimates should serve as an impetus for immediate consideration of policies that will help meet the projected growth in need. The growth by 2010 presents only the tip of the iceberg; the growth in needs will expand much more rapidly when the Baby Boom generation begins to retire.

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Background and Introduction

The aging of a nation has far-reaching implications for all aspects of social life, including decisions about public policy, allocation of resources, the provision of services, and concerns about quality of life. One of the greatest challenges facing an aging population is the financing and delivery of long-term care. With one of the largest older populations in the nation, Ohio is dealing with these challenges today. Debates about health and long-term care include: responsibility for and source of financing; determining the appropriate balance between formal paid services and informal unpaid care; and the feasibility, effectiveness, and consumer acceptance of managed care. In the midst of these controversies and debates about alternative solutions, one question crucial to the delivery of services persists: who will provide the long-term care that will be required by the growing older population?

Concerns about current and future personnel shortages in health care for older people have been voiced for over a decade. A 1987 National Institute on Aging report concluded, "a wide range of well-educated health personnel... will be required to respond to the diverse needs of older people. Under any conditions, requirements for personnel... will greatly exceed the current supply (National Institute on Aging, 1987: 2)." Long-term care is especially plagued by an imbalance between supply and demand. Frontline workers in long-term care (nursing assistants, homemakers, service assistants, home health aides and personal care assistants) are expected to represent the fastest growing occupation in the U.S. between 1992 and 2005 (Silvestri, 1993). Even with this growth, problems with shortages, recruitment, and retention of these workers are expected to reach crisis proportions in the near future (Atchley, 1996).

This report summarizes the growing need for long-term care staff in Ohio between 1995 and 2010. The relatively short length of this projection period is chosen for two reasons. First, the nature and extent of personnel needs will be shaped by a large number of factors in addition to the size of the older population (which can be projected quite confidently far into the future). Specifically, the development of assistive technology, trends in health and disability, and the structure and financing of long-term care will all have an effect on how and where that care is delivered, by whom, to whom, and under what circumstances. Managed care will certainly have an impact on long-term care financing and delivery but the nature and magnitude of that impact is still unclear. Since all of these factors are highly dynamic at this point, we chose a short time frame for projections. Second, and more importantly, we argue that the next fifteen years will provide a crucial window of opportunity for the state of Ohio to develop a plan and an infrastructure in preparation for the rapid growth of the older population that will begin in about 2015.

According to earlier work by Mehdizadeh, Kunkel, and Applebaum

(1996), Ohio's older population (age 65 and over) is expected to grow by only 3.5% over the next 15 years; however, our older population will become more disabled, with an increased percentage of women and larger numbers of people over the age of 85. This study examines the consequences of these trends on the need for staff in long-term care facilities and home care agencies. On the one hand, the modest growth in the older population might suggest that staffing needs would grow only slightly over the next 15 years. On the other hand, the changing composition of the older population could cause the demand for long-term care providers to increase at a faster rate than the older population.

This report summarizes population projections, the changing composition of the older population, and estimates of the 1995 Ohio long-term care population and staffing levels. Staffing patterns are described for the long-term care population served by formal home care and in long-term care facilities. Separate staffing ratios are provided for several different occupations. Finally, projections of both formal and informal staffing needs for in-home and institutional care are presented through 2010. Overall, this report documents that the need for long-term care providers will rise much more rapidly than the older population because of the projected changes in the age, disability, and gender composition of the older population as well as the increasing acuity levels of those served in nursing homes.

PROJECTIONS OF OHIO'S OLDER POPULATION

Table 1 provides projections of the older population for the years 1995 and 2010. As shown, the total older population is projected to be fairly stable until 2010. Over the period, because the small birth cohorts born during the Great Depression will be entering the older population, the older population is projected to drop to 1.43 million by 2005, and then rise slightly to 1.46 million by 2010. (See Appendix A for detailed breakdowns by five-year intervals.)

Table 1
State of Ohio Projected Older Population, by Age and Sex: 1995-2010

	1995			2010		
Age Group	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**
65-74	836,560	362,760	473,800	788,670	342,630	446,040
75-84	480,840	170,340	310,500	479,580	166,730	312,850
85+	147,724	39,563	108,161	188,336	49,793	138,543
Total	1,465,124	572,663	892,461	1,456,586	559,153	897,433

Notes: For more details on these projections, see Mehdizadeh et al. (1996) and Appendix A.

Table 2 shows the proportion of Ohio's population at different disability levels by age and gender for 1995. The numbers indicate that the proportion of persons with disabilities clearly increases with age. Overall, the population and disability projections suggest that while the total number of older people is projected to remain stable, the older population will become more female, older, and more disabled over the projection period.

These population and disability projections were the basis for the projections of long-term care staffing needs. We used the ratio of staff to the disabled older population in 1993 as the baseline; we then estimated the number of additional staff needed to care for the increasing disabled population by applying 1993 staffing ratios to the projected numbers of people needing long-term care. Further refinements were made to deal with the increasing acuity of the nursing home population. Details about the projection methodology are provided in Appendices B and C at the end of this report.

Current and Projected Staffing Needs: Home-Based Care

METHODS

Staffing needs for in-home care were estimated using data from the 1989 National Long-Term Care Survey (NLTCS). The projected amount of in-home care services was generated by combining the estimates of the time spent per person on in-home care with estimates of the number of older persons receiving long-term care services at home. (See Appendix B for details about the framework for projections and the National Long-Term Care Survey.) Table 3 presents both the 1995 estimates and projections of staffing needs through 2010.

Table 2
Disability Levels of 1995 Ohio Older Population by Age and Sex

	Male			Female		
	Disability Level			Disability Level		
Age Group	**Little or no**	**Moderate**	**Severe**	**Little or no**	**Moderate**	**Severe**
65-74	79.65	14.86	5.48	69.30	22.32	8.37
75-84	69.35	19.69	10.95	60.72	26.84	12.43
85+	48.05	30.53	21.41	37.80	27.72	34.48
All	74.80	17.18	8.01	62.28	24.43	12.70

Note: The numbers are the percentage of elderly disabled as a fraction of the total older population in that age and sex category. A moderate disability is defined as experiencing limitations in at least one of the following activities of daily living: eating, transferring in or out of bed or chair, getting to the toilet, dressing, bathing, or remaining continent; or in at least two of the following instrumental activities of daily living: walking, shopping, meal preparation, housekeeping, phone use, or transportation. A severe disability is defined as experiencing limitations in at least two activities of daily living or having cognitive impairment.

Table 3
Projected Staffing Needs for In-Home Care

					1990-2010 Growth in Staffing Needs	
	1995	2000	2005	2010	Number	Percentage
Paid FTEs of help with ADLs	7,793	8,818	9,288	9,807	2,014	25.8%
Paid FTEs of help with IADLs	23,302	25,117	25,718	26,640	3,338	14.3%
Total FTEs of Paid help	31,095	33,935	34,947	36,448	5,352	17.2%
Unpaid FTEs of help with ADLs	26,538	28,582	29,215	30,241	3,703	14.0%
Unpaid FTEs of help with IADLs	119,685	122,683	122,585	125,636	5,952	5.0%
Total FTEs of Unpaid help	146,223	151,266	151,800	155,877	9,654	6.6%
Broad Definition of Nursing:						
Paid FTEs	3,664	4,314	4,603	4,844	1,180	32.2%
Unpaid FTEs	2,977	3,146	3,182	3,422	446	15.0%
Total	6,641	7,460	7,785	8,266	1,625	24.5%
Narrow Definition of Nursing:						
Paid Hours	1,965	2,400	2,605	2,838	873	44.4%
Unpaid Hours	2,349	2,471	2,495	2,732	383	16.3%
Total	4,315	4,870	5,100	5,570	1,256	29.1%
Therapists:						
Physical Therapy	3,056	2,979	2,906	2,977	-79	-2.6%
Occupational Therapy	601	570	548	596	-5	-0.8%
Speech Therapy	208	188	173	188	-20	-9.7%
Hearing Therapy	108	106	104	107	-1	-1.2%
Medical Specialists:						
Dentist	1,077	1,062	1,042	1,071	-6	-0.6%
Podiatrist	974	980	972	997	23	2.4%
Optometrist	812	839	839	825	13	1.6%
Chiropractor	481	476	467	471	-10	-2.1%
Total FTEs	184,635	192,400	193,798	199,556	14,922	8.1%

Note: Nursing hours are also included as help with IADLs.

FINDINGS

Projections are provided for five-year intervals between 1995 and 2010. Estimated in-home care needs for 1995 include 31,095 full-time equivalents (FTE's) of paid help and 146,223 FTE's of unpaid help. The estimated 1995 Ohio older population living in the community with moderate to severe disability is 401,346 persons, requiring approximately 7.7 paid and 36.4 unpaid FTE caregivers per 100 persons.

The estimated need for nursing services in 1995 includes 3,664 paid and 2,977 unpaid FTE's using the broad definition of nursing; 1,965 paid and 2,349 unpaid FTE's using the narrow definition. (See Appendix B for a description of the nursing definitions.) The need for physical therapists (3,056) is greater than that for nursing services. The need for other therapists, however, is substantially lower: 601 occupational therapists, 208 speech therapists, and 108 hearing therapists. Among the medical specialists, the need for dentists is highest (1,077) followed by podiatrists (974), optometrists (812), and chiropractors (481).

Between 1995 and 2010, the older disabled population living at home is projected to increase by 2.5 percent. It is tempting to conclude that this will generate a 2.5 percent increase in in-home care staffing needs. However, this ignores the fact that the Ohio older population is projected to become older, more disabled, and more female. To the extent that staffing needs are greater for older and more disabled people, the staffing needs may rise rapidly despite the fact that the older population is expected to be relatively stable. Indeed, the last two columns of Table 3 which present the projected staff growth for various occupations between the years 1995 and 2010 confirm that staffing needs are generally expected to increase despite the stability of the older population. However, the projected growth in needs varies substantially across the different occupational categories.

For total paid hours by in-home care providers, there is a projected increase in demand of 17.2 percent, or 5,352 additional full-time staff. For unpaid hours, projected growth is 6.6 percent, or 9,654 additional full-time staff.

For total paid hours by in-home care providers, there is a projected increase in demand of 17.2 percent, or 5,352 additional full-time staff. For unpaid hours (informal caregiving, most often provided by family members), projected growth is 6.6 percent, or 9,654 additional full-time caregivers. The growth in the number of nurses is 24.5 percent (1,625 FTE's) using the broad definition of nursing, and 29.1 percent (1,256 FTE's) using the narrow definition. Generally speaking, the projected growth in the need for in-home care providers is substantial despite the fact that the older population is projected to decrease slightly by 2010. This illustrates the extreme sensitivity of community care needs to the gender, age, and disability composition of Ohio's older population.

The projected growth in the need for therapists and medical specialists is less pronounced. Across the four therapist

occupations, projected change in needs ranges from a decline of 9.7 percent among speech therapists to a decline of 2.6 percent among physical therapists, and a decline of 0.8 percent among occupational therapists. Among the medical specialists, projected change ranges from a decline of 2.1 percent among chiropractors to an increase of 2.4 percent among podiatrists. The fact that the projected growth rate in therapists and medical specialists is much lower and closer to the population growth rate is consistent with the fact that the needs for such assistance exhibit a fairly weak correlation with disability levels and age.

In the foregoing discussion, we have summarized the growing need for paid and unpaid hours of care. All of these projections are based on the assumption that there will be no fundamental changes in the way that care is delivered in the next fifteen years. Specifically, we are assuming that the mix of formal and informal caregiving will remain fairly stable over the projection period. Currently about three times as much informal care is provided as formal (paid) care. While the assumption of no change in this mix may be tenable for the near future, it is not so defensible for the long-term. With decreasing fertility rates and increasing mobility of younger generations, future cohorts of older people will very likely have fewer family caregivers available to them. The implications of changes in the availability of informal caregivers for the formal system are enormous. The future balance between formal and informal care is hard to predict because it will be the product of a number of dynamic, uncertain processes: the availability of informal care, economic pressures on health care financing, shifting ideological positions about family and government responsibility for care of older people, and public policy priorities which drive the allocation of resources.

Current and Projected Staffing Needs: Institutional Care

METHODS

The total number of nursing facility staff in 1993 were obtained using data from the Ohio Department of Health's Annual Survey of Long-Term Care Facilities (henceforth, ODH) and the Online Survey for Certification and Reporting (henceforth, OSCAR). (Information about the ODH and OSCAR data sets, and the staff-resident ratios is provided in Appendix C). Table 4 presents these estimates.

The numbers from these two sources differ because OSCAR includes only facilities that are renewing or applying for Medicare and/or Medicaid certification while ODH includes all licensed facilities. In addition, OSCAR includes contract employees while ODH does not. Finally, the number of occupations included and the nature of the categorization in the two data sets differs. OSCAR uses a more detailed job classification system. When occupational categories are comparable, estimates of the number of contract employees are generated for the ODH data based on the percentage of contract employees observed in the OSCAR data.

Table 4
Total Staffing Levels Reported in 1993 OSCAR and Estimated from 1993 ODH Data

	1993 OSCAR Data			1993 ODH Data		
	Regular FTEs	Contract FTEs	Total FTEs[1]	Regular FTEs	Estimated Contract FTEs[2]	Total FTEs
Administrators	3,986	26	4,012	1,581	10	1,591
Physicians, including medical directors	46	117	163	279	703	982
Registered nurses	6,298	51	6,349	5,161	42	5,203
Licensed practical nurses or vocational nurses	12,284	165	12,449	8,994	121	9,115
Nurses aides and orderlies	35,790	483	36,273	28,325	382	28,707
Pharmacists	41	76	117	115	216	331
Dietitians	242	136	378	230	129	359
Occupational therapists	109	141	250	179	231	410
Occupational therapy assistants or aides	108	146	254	225	302	527
Physical therapists	166	197	363	241	288	529
Physical therapy aides	634	185	819	760	221	981
Podiatrists[4]	0	34	35	52	34	86
Speech pathologists	83	153	236	166	305	471
Social workers	1,177	20	1,197	753	13	766
Miscellaneous technical personnel	NA[3]	NA	NA	1,699	NA	1,699
Miscellaneous non-health and non-technical workers	NA	NA	NA	17,461	NA	17,461
Dietetic aides	NA	NA	NA	2,107	NA	2,107
Activity directors or therapists	2,237	12	2,249	1,414	8	1,422
Respiratory therapists	NA	NA	NA	179	NA	179
Dentists	0	23	24	NA	NA	NA
Mental health services	36	54	90	NA	NA	NA
Housekeeping services	7,299	115	7,414	NA	NA	NA
Physician extenders	3	3	6	NA	NA	NA
Food services workers	10,509	268	10,777	NA	NA	NA
Other workers	5,694	73	5,767	NA	NA	NA
Total	86,751	2,471	89,222	69,921	3,005	72,926

[1] Parts may not sum to total due to rounding.

[2] Contract FTEs are estimated for the ODH data by using the ratio of contract to regular employees observed for each occupation in the OSCAR data when occupational categories are comparable.

[3] NA: not available either because the occupational category did not exist in the relevant data set or it was not possible to generate an estimate of the percentage of FTEs that are contract employees.

[4] There is an unusually large difference in the estimated number of podiatrists in the ODH and OSCAR data; using estimation methods above results in numbers which exceed the total of licensed podiatrists in Ohio. Contract and FTE employees were summed for estimates in this occupation.

In both data sets, relatively low-skill occupations represent the largest staffing need. For example, nurse aides and orderlies accounted for 36,273 FTE staff in the OSCAR data and 28,707 in the ODH data, about 40% of the staff in both data sources. In the OSCAR data, food service workers accounted for an additional 10,777 FTE's and housekeeping accounted for an additional 7,414 FTE's. In the ODH data, food service and housekeeping workers were likely to be included in the "miscellaneous non-health and non-technical workers," which accounted for 17,461 non-contract FTE's.

Other major staffing needs are for licensed practical or vocational nurses (9,115 in ODH and 12,449 in OSCAR); registered nurses (5,203 in ODH and 6,349 in OSCAR); administrators (1,591 in ODH and 4,012 in OSCAR)[1]; activities directors or therapists (1,422 in ODH and 2,249 in OSCAR); and social workers (766 in ODH and 1,195 in OSCAR).

There is evidence, both in Ohio and nationally, that nursing homes are serving an increasingly sick and disabled population. This trend appears to coincide with the change in the hospital prospective payment system. Since the implementation of this reimbursement strategy, the average length of stay of hospitalized Medicare recipients has declined from ten days in 1983 to seven days in 1995 (General Accounting Office, 1996). During the same time period, the proportion of the Medicare budget paid to nursing facilities increased from 1.1 percent in 1980 to 5.4 percent in 1995 (Health Care Financing Administration, 1996).

A comparison of Ohio's nursing home resident case mix scores between 1993 and 1996, by age group, shows that the index is higher for each age category in 1996.[2] This change reflects the increasing care needs of nursing home residents. These severely disabled residents are most often transferred from a hospital and stay in a nursing home for a very short time. Two recent studies of home care and nursing home use patterns in Ohio (Applebaum, Mehdizadeh, and Straker, 1997; Mehdizadeh, Applebaum, and Straker, 1997) found that many of these individuals are short stay residents. For example, about 60 percent of new nursing home admissions were from hospitals. More than half of the residents admitted to nursing homes from hospitals were discharged within three months of their admission. Another study (Harrington, Carrillo, Thollaug, and Summers, 1997) found that the national average summary score for resident acuity in Medicaid/Medicare certified nursing facilities increased from 98.2 in 1991 to 101.3 in the first half of 1995. During the same time period the average summary score for resident acuity in Ohio increased from 98.5 to 105.5. Ohio's nursing homes experienced increased resident acuity at a rate twice as high as the national average.

[1] OSCAR uses a category called "Administration" while ODH counts administrators, assistant administrators, and medical records administrators separately.

[2] These case mix scores are issued by the Ohio Department of Human Services and reflect the amount of time required to care for patients in nursing homes. Medicaid nursing home reimbursements depend upon the case mix scores, with higher scores reflecting higher amounts of time spent providing care.

Given the current pressure on the Medicare program to contain costs, Medicare managed care organizations are showing a rapid rate of growth in Ohio. Managed care aims to reduce costs by providing care in the least costly setting. Therefore, the practice of transferring patients from hospital to nursing homes for recuperation and recovery is likely to become even more common.

Caring for residents with higher acuity requires additional nursing home staffing. A recent report from the National Center for Health statistics shows that the number of FTE staff involved in direct patient care per 100 nursing home residents was 45.1 in 1973; 49.7 in 1977; 53.2 in 1985; and 60.3 in 1995 (Strahan, 1997). Between 1985 and 1995, direct patient care staff [3] per 100 residents increased by 0.71 FTE staff per year. Other studies found similar results. A study comparing staffing in all U.S. Medicaid/Medicare certified nursing facilities found that between 1991 and 1995 the total nursing staff increased by 1.05 FTE per 100 residents per year (Harrington et al., 1997). During the same time period in Ohio, the nursing staff resident ratio increased annually by 1.75 FTE staff per 100 residents. These data indicate that Ohio's above-average increase in nursing home resident acuity has significant implications for the need for staff involved in direct patient care. Two competing trends make staffing in other occupations more difficult to predict. Declines in nursing home occupancy rates, a current moratorium on new Medicaid certified nursing home beds, and relatively flat numbers of older people suggest little increase or even declines in long-term care occupations such as housekeeping, maintenance, and clerical staff. On the other hand, recent increases in the number of rest homes and assisted living facilities in Ohio suggest a need for additional personnel of all types to serve in these new settings. A best guess estimate at this time would suggest a shift in these occupations from one type of facility to another, with little overall growth in absolute numbers.

[3] Direct patient care staff includes administrative, medical and therapeutic staff, registered nurses, licensed practical/vocational nurses, and aides and orderlies.

FINDINGS

The projected number of nursing home staff responsible for direct patient care will increase by about 3,000 every five years in order to adequately care for the same number of increasingly more disabled and sick incoming residents.

Since we are projecting staffing requirements for all (certified and uncertified) nursing facilities we will employ the increase in staffing shown by the National Nursing Home Survey. The 0.71 FTE direct patient care per 100 residents per year will be distributed among all direct care staff categories based on their proportion of the total staff. As Table 5 shows, compared to ODH estimates for 1995, an additional 2,840 direct patient care staff will be needed in the year 2000 to care for the same number of nursing home residents. Since we expect this trend to continue in the near future, the projected number of nursing home staff responsible for direct patient care will increase by about 3,000 every five years in

order to adequately care for the same number of increasingly more disabled and sick incoming residents. Since we used increase in staffing in all nursing facilities rather than certified facilities, these are conservative estimates since the increase in acuity levels is likely to be greater among Medicaid/ Medicare facilities.

Implications

While these projections of increased staffing needs are compelling enough, they probably underestimate the actual growth in demand. Several factors lead us to conclude that though our projections are sound, they are conservative. First, the increasing acuity level of residents in nursing homes has an impact on both institutional staffing needs as well as community-based care providers. If nursing home beds are increasingly being occupied by sicker, more disabled people, the home-based long-term care population is probably also sicker and more disabled, since some people who might have gone to a nursing home are either "crowded out" of nursing homes and/or taking advantage of the increasing availability of home care. If the community-based long-term care population is becoming more disabled, then their care needs and the accompanying staffing demands will also increase. Second, the availability of family caregivers will very likely change for future cohorts of older people. Trends toward decreased fertility and increased geographic dispersion of families means that future generations of older people will have fewer children, and fewer children close by, to provide unpaid help. The need for formal care will then increase if informal family care is less available.

Table 5
Projected Direct Patient Care Staffing Needs for Ohio's Long-Term Care Facilities

Staff Classification	1995	2000	2005	2010
Administrators	1,628	1,721	1,814	1,907
Physicians, including Medical Directors	1,005	1,063	1,121	1,179
Registered Nurses	5,325	5,631	5,937	6,243
Licensed Practical Nurses or Vocational Nurses	9,329	9,864	10,399	10,934
Nurses Aides and Orderlies	29,381	31,066	32,751	34,436
Pharmacists	339	359	379	399
Occupational Therapists	419	442	465	488
Occupational Therapy Assistants or Aides	539	570	601	632
Physical Therapists	541	572	603	634
Physical Therapists Aides	1,004	1,062	1,120	1,178
Total	49,510	52,350	55,190	58,030

Source: Staffing needs in 1995 are projected from the total FTE's estimated from the 1993 Ohio Department of Health Annual Survey of Long-Term Care Facilities.

These projections should serve as an impetus for immediate consideration of plans, strategies, and policies that will help to meet current staffing shortages and projected future increases in needs. We know that the short time frame of these projections shows us only the tip of the iceberg; there will be exponential growth in demand that will accompany the aging of the Baby Boom generation. To meet this expanding challenge, planners, providers, legislators, and researchers would do well to take advantage of the window of opportunity afforded us during the next fifteen years of slow growth.

Summary

This report estimated current staffing patterns for long-term care for older people in Ohio and projected future demand through 2010. Such information is essential for planning to meet near-term increases in staffing needs for the growing disabled older population in Ohio. These projections should also serve as a starting point for planning for the more rapid growth that will occur after 2015.

We estimate that this may lead to a need for 9,000 additional FTE direct care staff in institution-based care between 1995 and 2010.

Currently, institution-based long-term care in Ohio employs between 72,422 and 89,222 full-time equivalent staff. Based on the OSCAR data, the largest staffing needs are for nurses aides and orderlies, housekeeping and food service workers, and nurses. Even if the number of nursing home residents remains unchanged, there is reason to believe that staffing needs in direct care occupations will increase. There is evidence that the acute and chronic care needs of nursing home residents are increasing because pressures for cost containment in Medicare have led many hospitals to transfer patients from hospitals to nursing homes for recovery. We estimate that this may lead to a need for 9,000 additional FTE direct care staff in institution-based care between 1995 and 2010.

Home-based care for Ohio's disabled older people also requires a substantial amount of staffing. Combining paid and unpaid help (but excluding medical specialists), it is estimated that 177,318 FTE caregivers were used in 1995 to provide care for disabled older people living at home in Ohio.

All things being equal from 1995-2010, we will need approximately 15,000 additional full-time equivalent staff to provide home-based long-term care.

While the disabled in-home older population is expected to increase by only 2.5 percent between 1995 and 2010, this study projects much higher growth in the demand for in-home care. For example, the study estimates that paid help will increase by 17.2 percent between 1995 and 2010. All

things being equal from 1995-2010, we will need approximately 15,000 additional full-time equivalent staff to provide home-based long-term care.

In-home care needs will increase significantly despite the fact that the older population is projected to increase only slightly because the older population is predicted to become more disabled and older over time. The growth in the demand for therapists and medical specialists is less pronounced. The reason is that the demands for such occupations depend less strongly on disability level and age compared with demand for in-home care.

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Appendix A: Population Projections

Estimates of the Ohio's older population by age, gender, and disability level are provided in Table A.1. In terms of disability levels, people are classified into one of three groups: little or no disability; moderate; or severe. The estimates are replicated from Mehdizadeh et al. (1996). For 1995, it was estimated that the total Ohio older population included 1.47 million people. Reflecting the greater life expectancy of women, 61 percent of the older population (.89 million) were women.

Table A.1
Projections of the Ohio Elderly Population: 1995-2010

					Female Population			Male Population			Males and Females		
					Disability Level			Disability Level			Disability Level		
Year	Age	Total Population	Total Female Population	Total Male Population	Little or no	Moderate	Severe	Little or no	Moderate	Severe	Little or no	Moderate	Severe
1995	65-74	836,560	473,800	362,760	328,360	105,772	39,668	288,948	53,908	19,904	617,308	159,680	59,572
	75-84	480,840	310,500	170,340	188,538	83,354	38,608	118,133	33,545	18,662	306,671	116,899	57,270
	85-94	147,724	108,161	39,563	40,885	29,983	37,293	19,011	12,081	8,471	59,896	42,064	45,764
	All	1,465,124	892,461	572,663	557,783	219,109	115,569	426,092	99,534	47,037	983,875	318,643	162,606
2000	65-74	764,440	432,620	331,820	299,421	96,764	36,435	263,920	49,514	18,386	563,341	146,278	54,821
	75-84	516,740	334,530	182,210	203,120	89,979	41,431	126,463	35,832	19,915	329,583	125,811	61,346
	85-94	165,133	120,557	44,576	45,488	33,376	41,693	21,451	13,593	9,532	66,939	46,969	51,225
	All	1,446,313	887,707	558,606	548,029	220,119	119,559	411,834	98,939	47,833	959,863	319,058	167,392
2005	65-74	729,910	413,520	316,390	287,093	92,080	34,347	252,256	46,888	17,246	539,349	138,968	51,593
	75-84	524,210	340,750	183,460	206,935	90,950	42,865	126,734	36,384	20,342	333,669	127,334	63,207
	85-94	172,459	126,423	46,036	47,543	34,931	43,949	22,122	14,045	9,869	69,665	48,976	53,818
	All	1,426,579	880,693	545,886	541,571	217,961	121,161	401,112	97,317	47,457	942,683	315,278	168,618
2010	65-74	788,670	446,040	342,630	310,426	98,973	36,641	273,803	50,443	18,384	584,229	149,416	55,025
	75-84	479,580	312,850	166,730	190,002	83,308	39,540	114,866	33,226	18,638	304,868	116,534	58,178
	85-94	188,336	138,543	49,793	52,132	38,258	48,153	23,904	15,211	10,678	76,036	53,469	58,831
	All	1,456,586	897,433	559,153	552,560	220,539	124,334	412,573	98,880	47,700	965,133	319,419	172,034

Note: A moderate disability is defined as experiencing limitations in at least one of the following activities of daily living: eating, transferring in or out of bed or chair, getting to the toilet, dressing, bathing, or remaining continent; or in at least two of the following instrumental activities of daily living: walking, shopping, meal preparation, housekeeping, phone use, or transportation. A severe disability is defined as experiencing limitations in at least two activities of daily living or having cognitive impairment.

Appendix B: Estimating In-Home Care using the NLTCS Data Set

This appendix provides details about estimating the time spent delivering in-home care to the older population with disabilities using the National Long-Term Care Survey data set (henceforth, NLTCS). The estimation process involves the following steps. First, estimates of the number of older people requiring in-home care are generated by adjusting the projected older population figures (provided in Table A.1) to reflect the fact that some of the older population will be in long-term care facilities. Second, the 1989 NLTCS is used to obtain estimates of the amount of time spent per elderly person on in-home care as a function of age, disability, and gender. Finally, the estimates of the time spent per elderly person are combined with population estimates to generate a predicted amount of in-home care services required by the community-dwelling older population in Ohio.

To generate estimates of the older population in need of in-home care, it is assumed that the number of older people in nursing homes and their age and gender distribution is unchanged over time, and that all older people in nursing homes are "severely disabled." The number of older people in nursing homes is estimated using the ODH data for the six age/gender groups that correspond to those used for the population projections.[4] The older nursing home population is then subtracted from the corresponding overall population projections for the severely disabled (also given in Table A.1). The projected in-home populations for the "little or no disability" and "moderate disability" groups are identical to those for the corresponding projections of the Ohio population.

The 1989 National Long-Term Care Survey (NLTCS) was the third survey of a national sample of people age 65 and older at risk of or already experiencing chronic impairments. Important for this study is that the NLTCS community questionnaire collected data on the non-institutionalized sample's limitations with activities of daily living (ADL's) and instrumental activities of daily living (IADL's), the amount of help received with these activities, and the number of monthly visits with therapists and medical specialists. The non-institutionalized sample included 4,463 people and their informal caregivers. Restricting the data to those who completed usable interviews resulted in a sample of 3,054.

Particularly important for this study is that the NLTCS provides data on hours of in-home care received for assistance with ADL's and IADL's. These data were collected from interviews with up to six caregivers for each elderly respondent. Each caregiver also indicated whether they were paid for their services and the type of

[4] In the 1993 ODH data, it is estimated that the number of elderly women in nursing homes is 7,887 for 65-74 year olds; 22,220 for 75-84 year olds; and 30,801 for those 85 and over. For men, the corresponding figures were 4,637, 7,985, and 6,373.

services provided. In addition to caregivers, information was collected on the number of visits received in the prior month from physical therapists, occupational therapists, speech therapists, hearing therapists, dentists, podiatrists, optometrists, and chiropractors. These visits could have occurred either in-home or in the provider's office.

The information on the types of ADL's and IADL's that the respondent experienced limitations with were used to classify each respondent into one of the three disability categories used for the population projections. Employing the classification scheme used by Mehdizadeh et al. (1996), a person is defined to be moderately disabled when experiencing limitations in one ADL, or two or more IADL's. A person's disability is increased to the severe level if s/he is experiencing limitations in at least two ADL's. If a person does not experience sufficient limitations to be classified as "moderately" or "severely" disabled, s/he is classified as having little or no disability.[5]

To estimate in-home care needs of the Ohio population, the NLTCS population was broken into the 18 age/gender/disability groups that correspond to those used in construction of the population projections. For each group, in-home care needs are calculated on a per capita basis. A summary of the in-home needs for the average person in the sample, and separately for each of the 18 groups is given in Table B.1.

In terms of total paid hours by in-home caregivers, the average person in the NLTCS received only 1.1 hours per week of paid help for ADL's and 2.3 hours per week for IADL's. Unpaid hours are substantially higher, however, with the average person in the NLTCS receiving 3.2 hours per week for ADL's and 9.6 hours for IADL's. In total, the average person received 3.4 hours of paid help and 12.7 hours of unpaid help for ADL's and IADL's combined.

The amount of help received varied considerably across age, disability and gender categories. In almost all cases, the amount of paid and unpaid help rose with the level of disability for a given age and gender. The paid help per week ranged from a low of .16 hours per week (for men in the youngest age group with little or no disability) to a high of 16.8 hours per week (for women in the oldest age group with a severe disability). Unpaid total hours ranged from 1.2 hours per week for men in the oldest age group with the little or no disability to a high of 42.2 among men in the middle age group with a severe disability. Overall, inspections of the hours of in-home care reveal that the hours of care used generally rose with disability level.

In the NLTCS, in-home care providers were asked what types of services they provided. Given that nursing is an important part of in-home care, some estimate of nursing services would be useful. Unfortunately, the design of the survey makes it impossible to get a precise estimate of the number of nursing hours provided per week because each caregiver gave a list of all the various types of help provided (e.g. nursing, shopping, transportation) but the list did not indicate the number of hours involved in each task.

[5] The ADL's included in the NLTCS include eating; getting in and out of bed; getting around inside; dressing; bathing; using the toilet; continence; and cognitive function. The IADL's include housework; laundry; meal preparation; grocery shopping; getting around outside; and telephone use.

Table B.1

Per Capita In-Home Care Needs Estimated from the National Long-Term Care Survey

		65-74 Years Old			75-84 Years Old			85 or Older		
	Disability	**Little**	**Moderate**	**Severe**	**Little**	**Moderate**	**Severe**	**Little**	**Moderate**	**Severe**
Paid ADL Hours[1]	Female	0.000	0.046	2.000	0.000	0.125	3.725	0.000	0.435	6.782
	Male	0.000	0.000	3.439	0.000	0.642	2.660	0.000	0.122	5.135
Unpaid ADL Hours	Female	0.003	0.335	6.745	0.005	0.397	11.514	0.000	0.715	13.147
	Male	0.000	0.528	14.939	0.000	0.629	13.720	0.000	2.659	12.750
Paid IADL Hours	Female	0.263	1.425	4.314	0.397	2.373	5.765	0.991	2.969	10.019
	Male	0.160	0.669	1.768	0.528	1.742	2.940	0.325	2.512	6.981
Unpaid IADL Hours	Female	1.357	7.131	17.985	1.812	7.308	16.964	1.615	12.197	19.981
	Male	3.503	14.226	21.744	3.513	13.450	28.520	1.233	14.732	22.115
Total Paid Hours	Female	0.263	1.471	6.314	0.397	2.499	9.490	0.991	3.404	16.801
	Male	0.160	0.669	5.207	0.528	2.384	5.600	0.325	2.634	12.115
Total Unpaid Hours	Female	1.361	7.467	24.730	1.818	7.706	28.478	1.615	12.912	33.128
	Male	3.503	14.755	36.683	3.513	14.079	42.240	1.233	17.390	34.865
Broad Definition of Nursing										
Paid Hours	Female	0.000	0.088	0.481	0.005	0.264	1.656	0.000	0.093	4.276
	Male	0.005	0.066	0.207	0.066	0.735	0.870	0.000	0.024	0.557
Unpaid Hours	Female	0.000	0.015	1.832	0.011	0.098	0.234	0.170	0.057	1.788
	Male	0.000	0.000	0.500	0.000	0.238	1.310	0.000	0.024	1.885
Total	Female	0.000	0.104	2.314	0.017	0.362	1.891	0.170	0.150	6.064
	Male	0.005	0.066	0.707	0.066	0.973	2.180	0.000	0.048	2.442
Narrow Definition of Nursing										
Paid Hours	Female	0.000	0.038	0.401	0.000	0.076	1.178	0.000	0.000	3.282
	Male	0.000	0.000	0.170	0.000	0.264	0.310	0.000	0.000	0.000
Unpaid Hours	Female	0.000	0.015	1.642	0.000	0.027	0.170	0.000	0.000	1.654
	Male	0.000	0.000	0.487	0.000	0.000	1.310	0.000	0.000	1.385
Total	Female	0.000	0.054	2.044	0.000	0.103	1.348	0.000	0.000	4.936
	Male	0.000	0.000	0.658	0.000	0.264	1.620	0.000	0.000	1.385

[1] Hours represents hours per week.

To provide some estimate of nursing services, two definitions of nursing are constructed. In the "narrow" definition, a person is said to provide nursing services if they say that the only service they provide is nursing. In the "broad" definition of nursing, a person is defined to provide nursing services if they indicate that they provide at least some nursing services, even if other services are also provided.

The weekly hours of nursing services provided to the average person in the NLTCS include 0.3 paid hours and 0.3 unpaid hours when using the narrow definition. This increases to 0.5 paid and 0.3 unpaid hours when the broad definition is used. Using either definition of nursing hours, the number of hours provided per week generally rises with disability level.

The NLTCS also provides information on the number of visits per month by therapists (physical, occupational, speech, and hearing) and medical specialists (dentists, podiatrists, optometrists, and chiropractors). The visits include those that occur in-home as well as at provider's office.

The mean number of per capita visits from specialists in one month ranges from a low of .008 for hearing therapists to a high of .21 for physical therapists. As shown in Table B.2, unlike the in-home services discussed above, visits with specialists do not exhibit a strong positive association with disability level. This is not entirely surprising given the types of specialties for which information is available. For example, there is little reason to expect that the number of visits with a dentist or hearing therapist will rise with disability level given that poor teeth and hearing problems are not reasons to be categorized as disabled.

To estimate the amount of staff needed to provide services for the elderly, the staffing needs per person are multiplied by the in-home population projections for each age, gender, and disability category. To obtain estimates of the in-home population, estimates of the number of nursing home residents by age and gender are drawn from the ODH data. Imposing the assumption that the nursing home population is severely disabled, the nursing home population estimates are subtracted from the estimated total number of severely disabled people for each age and gender category.

To make the figures comparable with those for nursing homes, hours are converted into FTE's using the assumption that 40 hours per week is one FTE. In the case of the specialists, we convert visits per month into FTE's by using results from a study by the Ohio Department of Health (1988) where it was estimated that the number of visits per FTE month was 96 for physical therapists, 47 for speech therapists, and 56 for occupational therapists. For the other specialists, no direct estimate was available so it is assumed that visits per month equal 67 -- the mean for the occupations for which data are available.

Table B.2

Per Capita In-Home Therapy and Specialist Needs Estimated from the National Long-Term Care Survey

		65-74 Years Old			75-84 Years Old			85 or Older		
	Disability	**Little**	**Moderate**	**Severe**	**Little**	**Moderate**	**Severe**	**Little**	**Moderate**	**Severe**
Physical Therapy Visits[1]	Female	0.033	0.351	0.416	0.063	0.193	0.541	0.102	0.031	0.217
	Male	0.000	0.415	0.939	0.071	0.125	0.310	0.325	0.000	0.128
Occupational Therapy Visits	Female	0.000	0.096	0.000	0.000	0.016	0.004	0.000	0.000	0.134
	Male	0.000	0.075	0.487	0.000	0.000	0.000	0.000	0.000	0.000
Speech Therapy Visits	Female	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Male	0.010	0.009	0.512	0.000	0.000	0.000	0.000	0.000	0.000
Hearing Therapy Visits	Female	0.000	0.003	0.014	0.002	0.013	0.008	0.008	0.015	0.000
	Male	0.005	0.028	0.012	0.020	0.000	0.000	0.000	0.000	0.000
Dentist Visits	Female	0.221	0.154	0.073	0.141	0.081	0.076	0.076	0.067	0.068
	Male	0.224	0.113	0.182	0.128	0.106	0.080	0.060	0.024	0.134
Foot Doctor Visits	Female	0.081	0.115	0.124	0.100	0.073	0.149	0.111	0.098	0.128
	Male	0.025	0.084	0.122	0.035	0.072	0.100	0.023	0.024	0.076
Optometrist Visits	Female	0.104	0.05	0.087	0.126	0.139	0.137	0.059	0.082	0.057
	Male	0.050	0.037	0.122	0.107	0.086	0.080	0.000	0.000	0.019
Chiropractor Visits	Female	0.090	0.069	0.043	0.073	0.059	0.020	0.017	0.000	0.027
	Male	0.020	0.047	0.000	0.061	0.047	0.050	0.000	0.024	0.000
Sample Size	Female	269	259	137	340	367	247	117	193	156
	Male	199	106	82	195	151	100	43	41	52

[1] Visits represents visits per month.

Appendix C: Staffing Needs using the ODH and OSCAR Data Sets

Two data sets are employed to estimate staffing levels in Ohio long-term care facilities. The Ohio Department of Health (ODH) collected the first data from a survey of all licensed long-term care facilities in 1993. For this study, the analysis was limited to facilities that were classified as nursing homes, rest homes, homes for the aging, and hospital-based long-term care units.[6] Henceforth, these data will be referred to as the ODH data. Each facility reported the number of full- and part-time staff hours worked in 21 different occupational categories during the third week of October 1993.

The second data set is a snapshot from June 1993, taken from data collected by the Health Care Financing Administration through nursing facility applications for Medicare and/or Medicaid certification. For future reference, these data will be referred to as the OSCAR data.[7] While this data is available for all states, only data on 972 Ohio facilities are used here.

The two data sets differ in several respects. First, the type of facilities included differs somewhat. While the Ohio Department of Health surveys are all licensed long-term care facilities, the OSCAR data is collected only from certified facilities.

Another important difference between the data sets is the information available regarding the residents and the staff. The ODH data have the advantage of providing information regarding the number of residents in various age and gender categories; the OSCAR data provide only the number of residents. In terms of the staff employed, the ODH and OSCAR data provide very similar information. However, only the OSCAR data provide any information on the number of contract employees. Given that some occupations, such as physical therapists, speech pathologists, and audiologists are only employed as contracted workers by over half of Ohio's facilities, the ability to include contract employee information is important (Cowles, 1995).

Staff-Resident Ratios in the ODH Data

Table C.1 summarizes the resident and staff information derived from the ODH data. The results indicate that in 1993 the average facility had 86.0 residents and that there were 87,786 residents in all Ohio facilities combined. This included residents of all ages.

[6] This excludes mental nursing homes, alcoholic nursing homes, county homes, and homes for the mentally retarded or persons with related conditions.

[7] OSCAR stands for "Online Survey Certification and Reporting."

Table C.1
Staffing Levels in Long-Term Nursing Facilities as Reported in 1993 Ohio Department of Health Annual Survey of Long Term Care Facilities (1,021 Facilities)

	FTEs per 100 Residents	FTE Average per Facility	Total FTEs
Administrators	1.16	1	1,022
Records Administrators	0.63	0.54	559
Physicians	0.31	0.27	279
Registered Nurses	5.88	5.05	5,161
Licensed Practical Nurses	10.24	8.81	8,994
Nursing Aides	32.27	27.74	28,325
Licensed Pharmacist	0.13	0.11	115
Dietitian	0.26	0.22	230
Dietetic Aides	2.4	2.06	2,107
Occupational Therapist	0.2	0.17	179
Occupational Therapist Aides	0.25	0.22	225
Physical Therapists	0.27	0.23	241
Physical Therapist Aides	0.86	0.74	760
Respiratory Therapists	0.2	0.17	179
Podiatrists	0.05	0.05	52
Speech Pathologists	0.18	0.16	166
Activity Directors	1.61	1.39	1,414
Social Workers	0.85	0.73	754
Miscellaneous Social Workers	0.46	0.39	408
Miscellaneous Technical Personnel	1.94	1.66	1,699
Miscellaneous Non-Health and Non-Technical Workers	19.89	17.1	17,461
Total	80.21	68.97	70,415

Note: ODH data show 87,786 residents, with an average of 85.98 residents per facility.

Staffing levels were available for 21 different occupations in the ODH data. The number of full-time equivalents (FTE's) is provided for both part-time and full-time workers. In total, ODH reported 70,415 FTE's employed at all long-term care facilities in Ohio. This yields a ratio of 80.2 FTE's for every 100 long-term care residents.

Staffing per 100 residents varied substantially across occupations. The occupations with the highest staff/resident ratios were nursing aides (32.3 per 100 residents), miscellaneous non-health and non-technical workers (19.9), licensed practical nurses (10.2), registered nurses (5.0 per 100 residents), and dietetic aides (2.04). The remaining staffing categories had less than 2.0 employees per 100 residents. There was less than one FTE per 100 residents in all of the following occupations: records administrators, physicians, pharmacists, occupational therapists, occupational therapist aides, dietitians, physical therapists, physical therapists aides, respiratory therapists, podiatrists, speech pathologists, social workers, and miscellaneous social workers). Occupations with between one and two FTE's per 100 residents included administrators, activity directors, and miscellaneous technical personnel.

Staff-Resident Ratios in the OSCAR Data

Table C.2 summarizes the 1993 resident and staffing information derived from the OSCAR data. According to OSCAR, there were 972 long-term care facilities in Ohio that applied for Medicare/Medicaid certification in 1993. There were 81,273 residents at the surveyed facilities and an average of 83.6 residents per facility.

Aggregating across all occupations, there were 89,222 workers in long-term care facilities implying 109.8 staff for every 100 residents. Unlike the ODH data, OSCAR provides a separate estimate for the number of contract and non-contract employees. The ODH data reports only the number of part-time and full-time staff. Unfortunately, it is not clear from the ODH survey whether contract employees were included in the employee count. However, according to the OSCAR data, contracted workers were a relatively small portion (2.8 percent) of the long-term care facility work force.

There is considerable variation in the staff-resident ratios across occupation groups. The highest staffing needs were for nurse aides and orderlies (44.6 per 100 residents), licensed practical nurses or vocational nurses (15.3), food service workers (13.3), housekeeping services (9.1), registered nurses (7.8), administrators (4.9), and activities therapists (2.8). The remaining staffing categories had fewer than 2 FTE's per 100 residents.

The percentage of workers contracted (provided in the last column of Table C.2) varied widely across occupation groups. Generally speaking, the positions that were most likely to be contract employees were in the specialty occupations that have low staff-resident ratios. There are 11 occupations in which over one-half of the FTE's were provided by contract employees: podiatrists (97.6 percent of FTE's provided by contract employees), dentists (96.8), medical directors (73.8), physicians other than medical directors (65.5), pharmacists

Table C.2
Staffing Levels in Long-Term Nursing Facilities as Reported in HCFA's 1993 Online Survey of Certification and Recording (972 Facilities)

	FTEs per 100 Residents	FTE Average per Facility	Total FTEs	% of FTEs Contracted
Administrators	4.936	4.13	4,012	0.65
Medical directors	0.14	0.12	120	73.84
Physicians other than medical directors	0.05	0.04	43	65.52
Registered nurses	7.81	6.53	6,349	0.8
Licensed practical or vocational nurses	15.32	12.81	12,449	1.32
Nurse aides and orderlies	44.63	37.32	36,273	1.33
Pharmacists	0.14	0.12	117	65.34
Dietitians	0.46	0.38	378	36.05
Occupational therapists	0.3	0.25	250	56.44
Occupational therapy assistants or aides	0.31	0.26	254	57.34
Physical therapists	0.44	0.37	363	54.38
Physical therapy assistants and aides	1.01	0.84	819	22.53
Podiatrists	0.04	0.03	35	97.58
Speech-language pathologists	0.29	0.24	236	64.81
Social workers	1.47	1.23	1,197	1.64
Dentists	0.02	0.02	24	96.77
Mental health services	0.11	0.09	90	59.82
Housekeeping services	9.12	7.63	7,414	1.54
Physician extenders	0	0	6	55.23
Activities therapists	2.77	2.31	2,249	0.55
Food services workers	13.26	11.09	10,777	2.48
Other workers	7.1	5.93	5,767	1.26
Total staffing	109.78	91.79	89,222	2.78

Note: OSCAR data show 81,273 residents, with an average of 83.61 residents per facility.

(65.3), speech-language pathologists (64.8), mental health services (59.8), occupation therapy assistants or aides (57.3), occupational therapists (56.4), physician extenders (55.2), and physical therapists (54.4). While these occupations had the majority of FTE's generated by contract employees, all of these occupations were relatively small relative to the total staffing needs of the long-term care facilities. In fact, these 11 occupations combined represented only 1.7 percent of the 89,222 FTE's at Ohio long-term care facilities.

There were 8 occupations that had less than 3 percent of FTE's generated by contract employees: food service workers (2.5 percent are contract employees), social workers (1.6), housekeeping (1.5), licensed practical or vocational nurses (1.3), registered nurses (.8), administrators (.6), and activities therapists (.6). These occupations generally employed larger numbers of staff than those for which contracting was common and together they accounted for 90.5 percent of all FTE's generated at long-term care facilities.

Generally speaking, the fact that the ODH data do not provide information on contract employees is only a minor problem for the occupations where staffing needs are relatively high (e.g., nursing, nurses aides, and food service workers). The omission of contract employees will be most important for high skill specialty occupations where FTE's per resident are relatively low (e.g., physicians, therapists, and pharmacists).

To provide some check on the validity of the staff estimates, this section compares estimates of the staff to resident ratios reported in the ODH and OSCAR data. There are several difficulties in making comparisons between the two data sets. First, the OSCAR data include contract employees whereas ODH data do not. To adjust for this, the ODH staff-resident ratios are adjusted by including an estimate of the number of contract employees. Another difficulty in making the comparison is that the staffing categories are not identical in the two surveys. Thus, comparisons are available only for the staffing categories that are common to the two data sets. In some cases, merging categories in one or both of the data sets creates comparable staffing categories. Finally, the ODH and OSCAR data do not cover the same long-term care facilities, though there should be a good deal of overlap. The ODH data covers all licensed long-term care facilities whereas OSCAR covers only those facilities that are applying for Medicare/Medicaid Certification.

Table C.3 presents the comparison of the ODH and OSCAR staff/resident ratios in the last column. To make the staff/resident ratios comparable, an estimate of the number of contract employees is generated for the ODH sample using the estimated fraction of employees that are contract employees obtained from the OSCAR data.[8] Overall, the estimated staff/resident ratios are lower for the ODH data even after adding in an estimate of the number of contract employees. The staff/resident ratio (with contract FTE's excluded) is 109.8 in the OSCAR data but only 82.5 in the ODH data. This higher staffing ratio might reflect the fact that the ODH data include a slightly

[8] Define r_j as the fraction of employees that are contracted in occupation j in the OSCAR data. The number of occupation j contract employees in the ODH data is estimated as r/(l-r) times the number of ODH employees in occupation j.

different set of nursing homes. For example, the ODH data include nursing homes regardless of whether they are Medicare / Medicaid certified. The OSCAR data include only those facilities applying for certification or recertification.

Of the 27.3 point differential in the staff/resident ratio between the two data sets, 11.9 is accounted for by the nurse aides and orderlies category, 4.9 by licensed practical or vocational nurses, and 1.9 by registered nurses. The remainder of the differential is primarily from categories that cannot be compared across the two data sets.[9]

[9] There is an unusually large difference in the estimated number of podiatrists in the ODH and OSCAR data. We expect that this is due to the fact that a relatively small number of FTE's are used to estimate the percent of employees contracted from the OSCAR data and that the estimated number of contracted podiatrists is too high for the ODH data. Alternatively, the ODH data may already include contracted podiatrists as employees.

Table C.3

A Comparison of Staffing Ratios Computed from 1993 OSCAR and 1993 ODH Data

	OSCAR Data		ODH Data			COMPARISON
	FTEs per 100 Residents	% of FTEs Contracted	FTEs per 100 Residents	Estimated Number of Contract Employees per 100 Residents	Total FTEs per 100 Residents	OSCAR Minus ODH Estimate of Staff per 100 Residents
Administrators	4.94	0.65	1.80	0.01	1.81	3.13
Physicians, including medical directors	0.20	71.64	0.317	0.80	1.12	-0.91
Registered nurses	7.81	0.80	5.879	0.04	5.93	1.88
Licensed practical nurses or vocational nurses	15.32	1.32	10.245	0.13	10.38	4.94
Nurses aides and orderlies	44.63	1.33	32.265	0.43	32.70	11.93
Pharmacists	0.14	65.34	0.130	0.24	0.37	-0.23
Dietitians	0.46	36.05	0.261	0.14	0.40	0.05
Occupational therapists	0.30	56.44	0.203	0.26	0.46	-0.16
Occupational therapy assistants or aides	0.31	57.34	0.256	0.34	0.60	-0.29
Physical therapists	0.44	54.38	0.274	0.32	0.60	-0.16
Physical therapist aides	1.01	22.53	0.865	0.25	1.12	-0.10
Podiatrists	0.04	97.58	0.059	2.38	2.44	-2.40
Speech pathologists	0.29	64.81	0.189	0.34	0.53	-0.24
Activity directors or therapists	2.77	0.55	1.611	0.00	1.62	1.15
Social workers	1.47	1.64	0.858	0.01	0.87	0.59
Miscellaneous technical personnel	NA	NA	1.936	NA	NA	NA
Miscellaneous non-health and non-technical workers	NA	NA	19.89	NA	NA	NA
Dietetic aides	NA	NA	2.40	NA	NA	NA
Respiratory therapists	NA	NA	0.20	NA	NA	NA
Dentists	0.02	96.77	NA	NA	NA	NA
Mental health services	0.11	59.82	NA	NA	NA	NA
Housekeeping services	9.12	1.54	NA	NA	NA	NA
Physician extenders	0.00	55.23	NA	NA	NA	NA
Food services workers	13.26	2.48	NA	NA	NA	NA
Other workers	7.10	1.26	NA	NA	NA	NA
Total	109.781	2.77	80.213	2.29	82.50	27.28