

The Adult Disabled Population (16-74) in Massachusetts: Its Size and Demographic/Socioeconomic Composition in 2003-2004

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Introduction

Public policymaking and program planning in the fields of adult education, health, income transfers, vocational rehabilitation, and workforce development for the disabled population are dependent upon knowledge of the numbers, characteristics, and geographic locations of individuals experiencing disabilities. In recent years, there has been a growing national interest in developing public policies and programs to promote the employability of the disabled, especially adults receiving Social Security Disability and Supplemental Security Income disability payments (SSI).¹

During the fall of 2005, leaders of the Massachusetts Rehabilitation Commission, including the Commissioner Elmer Bartels, met with staff from the Center for Labor Market Studies and the Commonwealth Corporation to discuss the feasibility of conducting research on the disabled population in the state of Massachusetts and the New England region to improve our knowledge base on the size and characteristics of the state's disabled population, their geographic locations across the state, their labor market experiences and problems, and their personal and familial economic well-being. During the past few months, research staff within the Center for Labor Market Studies have been analyzing a variety of national, regional, and state data bases that contain information on the disabled population. The focus of our analysis is on those disabled persons who were 16-74 years old. Both children under 16 and the elderly 75 and older, who have very limited labor force attachment, are excluded from the analysis. This research report is the first in our series. It provides a comprehensive array of estimates of the recent size of the adult disabled population, a profile of their demographic/socioeconomic backgrounds, the types of disability problems they experience, and projections of the future size and age composition of the state's disabled population.

An Overview of the Report's Contents

The research report will begin with a discussion of the "disability" concepts and measures underlying all of the estimates of the disabled population of the state, the New England

¹ For a review of trends in the employment rates of the disabled in the nation and changes in public policy to promote the employment of the disabled,

See: (i) John Bound and Timothy Waidmann, "Accounting for Recent Declines in Employment Rates Among the Working-Aged Disabled," *The Journal of Human Resources*, Vol. 37, No. 2, 2002, pp. 231-250; (ii) Richard V. Burkhauser and Mary C. Daly, "Policy Watch: U.S. Disability Policy in a Changing Environment," *The Journal of Economic Perspectives*, Volume 16 (1): 2002, pp. 213-224.

region, and the nation appearing in this paper. The data sources that were used to generate these estimates are also described.² The section on concepts, measures and data sources will be followed by a presentation and discussion of estimates of the number of disabled adults (16-74 years old) in Massachusetts, New England, and the U.S. during 2003-2004 and the overall incidence of disability problems among this age group. Findings on the overall size of the disabled population will be supplemented with an examination of the demographic/socioeconomic composition of the state's disabled population, including breakouts of the data by gender, age group, educational attainment, race-ethnic origin, and nativity status. Estimates of the incidence of disability problems among each of these demographic subgroups in Massachusetts in 2003-2004 will be presented, variations in these rates across demographic groups will be assessed, and findings for the state will be compared to those for the New England region and the entire nation. For several of these disability incidence measures, we will show how Massachusetts ranked among the 50 states and the District of Columbia.

The next section will be devoted to a presentation of variations in the size and incidence of disability problems across eight counties of the state and two central cities (Boston and Springfield). The geographic analysis will be followed by an examination of the types of disability problems reported by adults in our state, the prevalence of multiple disability problems, and the relationships between the type of disability problems and the employment rates of 16-65 year old disabled adults in our state during 2003-2004.

To gain insight into the future growth of the disabled adult population in Massachusetts, we have generated two sets of estimates of the size and age composition of the disabled population in 2015. A more disaggregated analysis of the potential growth in the older disabled population (55-74) will be presented, including an assessment of the impacts of improved human capital traits of older persons on their future disability rates. The final section of the paper will provide a brief summary of key findings and discuss their future implications for health, vocational rehabilitation, and workforce development programs in the Commonwealth.

² In an appendix to this paper (Appendix A), we compare estimates of the disabled population from the 2000 Census with those from the 2003/2004 American Community Surveys and explain why the ACS numbers are believed to be more reliable.

Defining and Measuring the Disabled Population in Massachusetts, New England, and the U.S.

Any measure of the disabled population is dependent on a definition of the “disabled” and a household survey technique/administrative data reporting system that will generate the requisite data. The definition of the “disabled” that underlies all of the estimates appearing in this paper is the same as that used by the U.S. Census Bureau in its official estimates of the nation’s disabled population and exactly the same as that used by the Rehabilitation Research and Training Center of Cornell University in its analysis of state and national ACS data.³ According to this definition, an individual will be classified as “disabled” if he or she meets any one of the following six criteria. The information is based on the self-reports of respondents to the ACS survey and is not tied to the receipt of any cash assistance for the disabled or their participation in any rehabilitation program.

- Person has any of the following long lasting conditions: blindness, deafness, or a severe vision or hearing problem
- Person has a long lasting condition that “substantially limits one or more basic physical activities,” such as walking, climbing stairs
- Because of a physical, mental, or emotional condition lasting 6 months or more, this person has difficulty “learning, remembering, or concentrating”
- Because of a physical, mental, or emotional condition lasting 6 months or more, this person has difficulty “dressing, bathing, or getting around inside the home”
- Because of a physical, mental, or emotional condition lasting 6 months or more, this person has difficulty “going outside the home alone to shop or visit a doctor’s office”
- Because of a physical, mental, or emotional condition lasting 6 months or more, this person has difficulty “working at a job or business”.

Individual respondents were allowed to check more than one disability type. As will be revealed below, there is a fairly high degree of overlap among these six disability categories. In

³ We use different age breakouts to estimate the disabled population of the state. The Cornell University study focuses on 21-64 year olds while we use the 16-74 age group as the focus of our analysis. See: Rehabilitation Research and Training Center on Disability Demographics and Statistics, 2004 Disability Status Reports, Cornell University, www.disabilitystatistics.org.

Massachusetts, 61% of all disabled persons ages 16-74 were classified as disabled because of difficulty “working at a job or business,” but most (83%) of the work-disabled cited at least one other form of disability. In our analysis, we will examine the degree of overlap among these various types of disabilities.

The estimates of the size and characteristics of the disabled population in Massachusetts are based on the findings of the American Community Surveys (ACS) for 2003 and 2004. The ACS survey is a national household survey that has been conducted annually by the U.S. Census Bureau since 2000.⁴ The national ACS survey in 2004 completed interviews with nearly 569,000 households across the country, including 12,747 sample households in the state of Massachusetts and 36,300 interviews with household across New England. A similar number of Massachusetts households (12,890) completed interviews during the 2003 ACS survey.

The questionnaire that is used in conducting the ACS survey is quite similar in format to the long form questionnaire that was used by the U.S. Census Bureau in administering the 2000 Census of Population and Housing. The questionnaire collects detailed information on the demographic and socioeconomic characteristics of each household member (age, gender, race-ethnic group, marital status, educational attainment, school enrollment status, household living arrangements), their labor force status at the time of the survey and their labor market experiences in the prior calendar year, their annual earnings from employment, their personal and household income, the sources of their personal and household income, and their poverty/near poverty status. The availability of these data for individual respondents allows us to paint a comprehensive, statistical portrait of the disabled population, to cross-tabulate their characteristics to examine how the incidence of disability problems varies across age and gender/educational attainment subgroups, to identify the labor market status and labor market problems of various subgroups of the working-age disabled population, and to determine the income, poverty, and public assistance status of various subgroups of the disabled population.

The public use files from the national and state ACS surveys unfortunately do not contain substate geographic identifiers. We can only identify the state of residence of each sample household. The U.S. Census Bureau has, however, published a variety of tables on the estimated

⁴ For a more detailed review of the design features and purposes of the American Community Survey, See: U.S. Census Bureau, Accuracy of the ACS Data (2004), web site, www.census.gov/acs.

numbers of disabled individuals in selected counties and cities in each state. We will analyze findings of the 2003 and 2004 ACS surveys on the disabled population in eight counties of the state and two central cities (Boston and Springfield).

The ACS surveys for 2003 and 2004 ask the same disability questions as the 2000 Census long-form questionnaire, but the layout of the disability questions and the skip patterns built into the reporting instructions in the 2003 and 2004 ACS surveys were different from those in the 2000 Census questionnaire. These differences in the layout of the questions and the skip patterns have been found to generate very large differences between the 2003/2004 ACS and 2000 Census estimates of the size of the disability population in the U.S. and Massachusetts and especially in the employment rates of the working-age disabled. The 2000 Census data base yields a much larger (80% larger) disabled population that also was much more likely to be employed in 2000 than the estimates derived from the 2004 ACS surveys. (See Appendix A for a more detailed discussion and empirical examination of these issues). The U.S. Census Bureau has issued a research paper that discusses the sources and magnitude of these differences in disability estimates at the national level and explains why the 2003/2004 ACS questionnaires are believed to be more reliable for conducting any analysis of the disabled population. The research paper by Sharon Stern and Matthew Brault of the U.S. Census Bureau's Division of Housing and Household Economic Statistics was titled: "Disability Data from the American Community Survey: A Brief Examination of the Effects of a Question Redesign in 2003".

Estimates of the Number of Disabled Persons and the Incidence of Disability Problems in Massachusetts, New England, and the U.S., 2003-2004

The first set of our analyses was designed to generate estimates of the number of respondents in the 16-74 age range who were disabled in the state of Massachusetts at the time of the 2003 and 2004 American Community Surveys.⁵ Any individual who reported that he/she experienced one or more of the six types of disability problems was classified as disabled. The findings for the two years were averaged to obtain estimates of the number of persons with a disability problem and the proportion of the 16-74 year old population with a disability. Findings for Massachusetts are compared to those for the U.S. and each of the other five New England states.

⁵ The ACS survey is confined to members of households. Persons living in group quarters, such as college dormitories, jails, prisons, mental hospitals, and nursing homes are excluded from the survey.

During 2003-2004, nearly 509,000 persons ages 16-74 in Massachusetts reported some type of disability problem. They accounted for 11.3% of the state's 16-74 year old population.⁶ (Table 1). In the U.S., there were 27.270 million disabled persons in the same age group yielding a disability rate of 13.4%. In the entire New England region, the number of 16-74 year old persons reporting some type of disability was nearly 1.2 million, representing just under 12 percent of the region's population.

The incidence of disability problems among the six New England states during 2003-2004 varied fairly widely. The disability rates ranged from lows of 10% in Connecticut and 11% in Massachusetts to a high of just under 17% in the state of Maine (Table 1 and Chart 1). Connecticut ranked lowest among the 50 states and the District of Columbia on this measure while Massachusetts ranked 8th lowest. In contrast, Maine had the seventh highest disability rate among the 50 states.

Table 1:
Estimated Number of 16-74 Year Old Persons with A Disability in
Massachusetts, the Other New England States, and the U.S.
(2003-2004 Averages)

Geographic Area	Disabled Population	Percent of Population with Disability	Rankings Among Regions/States
U.S.	27,270,783	13.4%	
New England	1,191,878	11.9%	Lowest
Connecticut	246,534	10.2%	Lowest
Maine	157,819	16.7%	7 th Highest
Massachusetts	508,926	11.3%	8 th Lowest
New Hampshire	113,200	12.2%	14 th Lowest
Rhode Island	100,778	13.5%	25 th Highest
Vermont	64,621	14.5%	18 th Highest

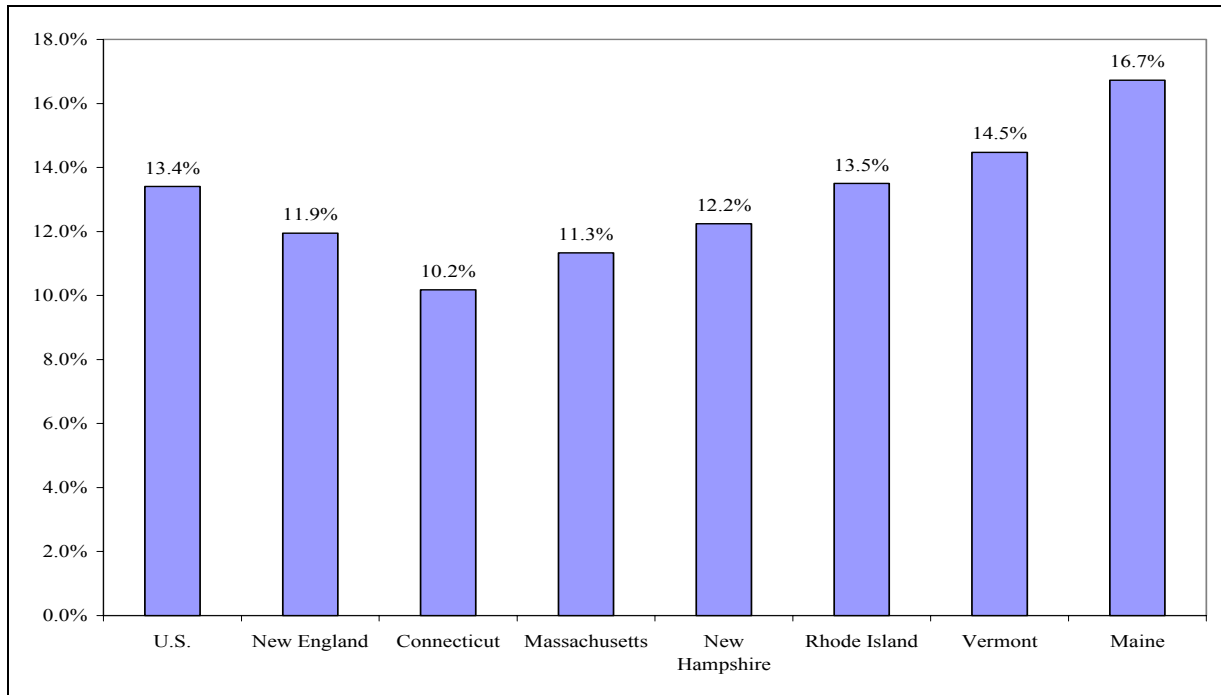
Source: 2003 and 2004 American Community Surveys (ACS), U.S. Census Bureau, tabulations by Center for Labor Market Studies

In absolute terms, during 2003-2004, the number of persons with a disability in each of the New England states ranged from a low of only 65,000 in Vermont to a high of 509,000 in Massachusetts. Their share of the 16-74 year old population varied by state, ranging from a low

⁶ All of the state disability rate estimates are based on a sample of households in each state and are thus subject to sampling error. The ACS samples in 2003 and 2004 in Massachusetts were quite large. Sampling error for the overall disability rate for 16-74 year olds in each year was only about .2%. Thus, a 90% confidence interval for the state estimate was approximately 10.9% to 11.7%.

of 10.2% in Connecticut to a high of nearly 17% in Maine (Chart 1). The share of the disabled population among 16-74 year olds in Maine ranked 7th highest among the 50 states and the District of Columbia. Massachusetts rank was 8th lowest and Connecticut ranked the lowest on this measure among all 50 states and the District of Columbia.

Chart 1:
Percent of 16-74 Year Olds that were Disabled in the
U.S., New England, and Individual New England States, 2003-2004



The Demographic and Socioeconomic Composition of the State’s Disabled Population in 2003-2004

As noted earlier, the questionnaire that was used in conducting the ACS survey collected a fairly comprehensive set of information on the demographic and socioeconomic characteristics of each household member. We have used the data on the demographic/socioeconomic characteristics of the disabled to produce a detailed statistical profile of their demographic characteristics, including their gender, age, race-ethnic, educational attainment, and nativity characteristics at the time of the 2003 and 2004 ACS surveys. Table 2 displays information on the percentage distribution of the 16-74 year old disabled population Massachusetts, New England, and the U.S. across these demographic subgroups. In all three geographic areas, a slight majority of the disabled population were women. Among all 16-74 year old persons with some

type of disability in Massachusetts, 52% of were women and 48% were men (Table 2). Findings were very similar in both New England and the U.S.

Table 2:
The Percentage Distribution of the Disabled Population in Massachusetts,
New England, and the U.S., by Selected Demographic Traits 2003-2004 Averages

Group	Massachusetts	New England	U.S.
All	100.0	100.0	100.0
Gender			
Male	48.1	48.9	48.3
Female	51.9	51.1	51.7
Race/Ethnic Origin			
White	78.6	82.6	69.7
Black	6.4	5.6	14.5
Asian	3.0	2.0	2.4
Hispanic	10.3	7.6	10.3
Mixed	1.0	1.3	1.6
Other	0.7	1.0	1.4
Age			
16-19	3.9	3.9	3.8
20-24	4.2	4.1	4.5
25-34	9.9	9.1	9.1
35-44	16.3	16.5	15.4
45-54	20.5	22.0	21.9
55-64	23.4	23.5	23.7
65-74	21.8	20.8	21.7
Educational Attainment			
<12 or 12, No HS Diploma	28.1	26.5	29.9
High School Diploma/GED	33.0	35.2	33.0
Some College	23.3	23.2	25.3
Bachelor's Degree	10.1	9.5	7.6
Master's or Higher Degree	5.5	5.6	4.2
Nativity Status			
Foreign Born	18.8	13.6	10.6
Native Born	81.2	86.4	89.4

Source: 2003 and 2004 American Community Surveys (ACS), U.S. Census Bureau, tabulations by Center for Labor Market Studies.

The data on the race and Hispanic origin characteristics of respondents were used to assign them into one of six mutually exclusive, race-ethnic groups. Hispanics can be members of any race, but they are excluded from each of the five race groups. Whites refer to White, non-

Hispanics. In Massachusetts, non-Hispanic Whites accounted for nearly 79% of all 16-74 year old disabled persons followed by Hispanics (10.3%), Blacks (6.4%), Asians (3%), and members of all other races (1.7%). The pattern for the New England region was consistent with that for Massachusetts. For the entire U.S., however, race-ethnic minorities, especially Blacks, accounted for a higher share (30%) of all 16-74 year old disabled persons, partly reflecting the higher share of minorities in the U.S. population.

Older persons (45 and older) were substantially more likely than their younger counterparts to report some type of disability. As a consequence, the 45+ group accounted for a relatively high share of the disabled in our state and the nation. The 45-74 year old disabled population in Massachusetts accounted for nearly two-thirds of the 16-74 year old disabled population while only 8% of the disabled were 16-24 years old. The age distributions of the disabled population in New England and the U.S. were quite similar to that for Massachusetts.

As will be revealed below, adults with limited schooling in Massachusetts were much more likely to be disabled than their better educated counterparts, especially college graduates. As a consequence, the less educated accounted for a high share of the disabled. Slightly over 28 percent of the disabled did not have a high school diploma or GED, and 61% had not completed any post-secondary schooling. Only 1 of 6 of the disabled in the state had a Bachelor's or higher degree. In the U.S., only 12 percent of the disabled in 2003 and 2004 held a Bachelor's or higher degree.

The immigrant population in Massachusetts has generated all of the state's net population growth over the past two decades.⁷ Combined with a modestly above average incidence of disability problems, the growth of the foreign born population in the state has led them to account for a relatively high share of the disabled (19%) in the state in recent years. In the U.S., only 1 of 10 of the disabled were foreign born in 2003-2004. The far higher share of the disabled that was foreign born in Massachusetts than in the U.S. is due to two different factors. First, the foreign born accounted for a higher share of the adult population in Massachusetts than in the U.S. during the 2003-2004 period (18.5% vs. 15.3%). Second, the native born in the U.S. are more likely to be disabled than they are in Massachusetts (14.2% vs. 11.3%) while the foreign

⁷ For a review of the impacts of immigration on state population growth, See: Andrew Sum, Johan Uvin, Ishwar Khatiwada, et.al., The Changing Faces of Massachusetts, Massachusetts Institute for a New Commonwealth, Boston, 2005.

born in Massachusetts are more likely to report themselves as disabled than they are in the U.S. (11.5% vs. 9.2%). Given the projected, overwhelming dependence of the state on foreign immigration for its future population growth, these findings suggest that immigrants will likely account for a rising share of the state's disabled population over the remainder of the decade.

Disability Rates Among 16-74 Year Olds in Massachusetts, New England, and the U.S, 2003-2004

Knowledge of the incidence of disability problems among key demographic and socioeconomic subgroups would be helpful for program planning and design. Estimates of the share of Massachusetts adults with a disability problem in gender, age, educational attainment, race/ethnicity and nativity subgroups are presented and analyzed in this section. The disability rate simply represents the ratio of the number of disabled persons in a given demographic group to the total number of persons in that demographic group who were living in households. For example, suppose that 500 persons in a demographic group containing 5,000 persons were disabled. The incidence of disability problems for this group would be 10.0% Findings for Massachusetts are compared to those for New England and the U.S.

Estimates of disability rates by age group for Massachusetts reveal that the likelihood of disability increases steadily with age after age 35. In Massachusetts, disability rates ranged from a low of 6 to 7 percent among 16-24 year olds to highs of 19% and 28%, respectively, among 55-64 year olds and 65-74 year old persons (Table 3 and Chart 2).⁸ Those in the 65-74 age group were five times as likely to report a disability as their peers in the 20-24 and 25-34 age groups.

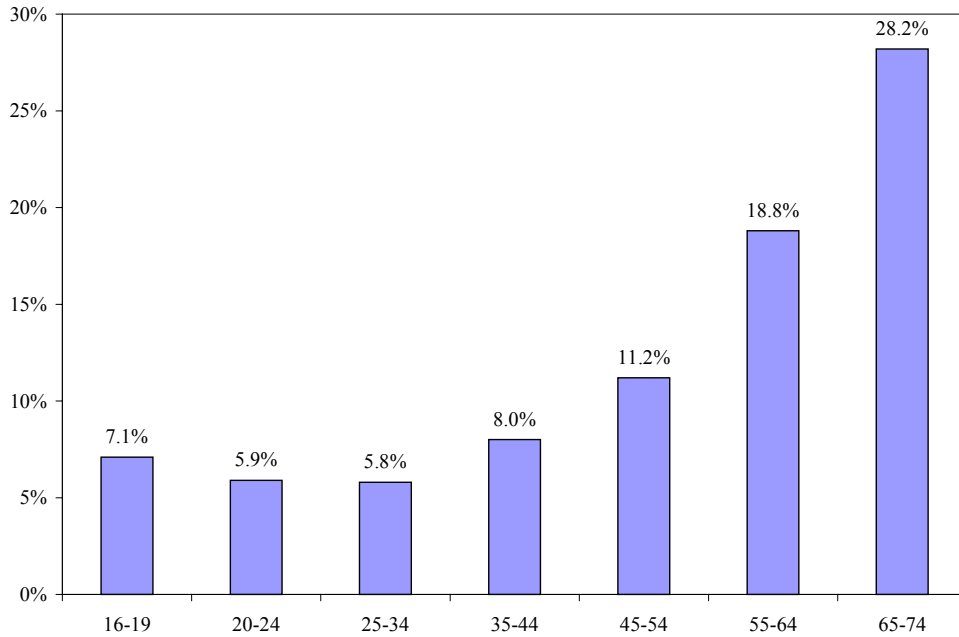
⁸ A separate analysis of disability rates among 75-84 year olds revealed that a sharply higher disability rate persisted among the 75-84 year old population in Massachusetts and the U.S. Disability rates among 75-84 year olds in Massachusetts during 2003-2004 was 44% compared to nearly 51% in the U.S.

Table 3:
Disability Rates Among the 16-74 Year Old Population in
Massachusetts, New England, and the U.S., (2003-2004) Averages
(Numbers in %)

Group	Massachusetts	New England	U.S.
All	11.3	11.9	13.4
Gender			
Male	11.2	12.0	13.2
Female	11.4	11.9	13.6
Race-Ethnic Origin			
White	10.9	11.8	13.5
Black	13.4	13.3	17.0
Asian	7.3	7.2	7.3
Hispanic	16.9	14.1	10.6
Mixed	17.8	21.2	21.3
Other	9.6	16.8	19.7
Age			
16-19	7.1	7.1	6.9
20-24	5.9	6.1	6.3
25-34	5.8	6.2	6.4
35-44	8.0	8.6	9.6
45-54	11.2	12.4	14.7
55-64	18.8	19.1	22.9
65-74	28.2	28.1	33.0
Educational Attainment			
<12 or 12, No HS Diploma	23.0	22.2	21.6
High School Diploma/GED	14.2	14.9	15.3
Some College	10.6	10.9	12.0
Bachelor's Degree	5.5	5.8	6.4
Master's or Higher Degree	4.4	5.4	6.7
Nativity Status			
Foreign Born	11.5	11.0	9.2
Native Born	11.3	12.1	14.2

Source: 2003 and 2004 American Community Surveys (ACS), U.S. Census Bureau, tabulations by Center for Labor Market Studies.

Chart 2:
Percent of the Population in Massachusetts that Were Disabled by Age
Group, 2003-2004 Averages



The age patterns of disability rates among male and female adults in Massachusetts during 2004 were quite similar (Table 4). Within both gender groups, estimated disability rates rose steadily and strongly from age 25-34 through age 65-74.⁹ The oldest of the age groups (i.e., those 65-74) had a disability rate between four and five times higher than that of 20-34 year olds. For example, among men, the disability rate of 65-74 year olds was nearly 28 percent versus only 5% for those 25-34. These findings on the age profiles of disability rates have important implications for the projected growth in these size of the state's disabled population as the baby boomers continue to move into the older age groups over the coming years. We will examine these implications of the aging of the baby boom generation more fully in a later section of this paper.

⁹ Among women, disability rates in both 2003 and 2004 rose steadily from ages 20-24 onward. The biggest gender gaps in disability rates were between teenagers and 20-24 year olds.

Table 4:
Disability Rates of 16-74 Year Olds in Massachusetts by Age Group and Gender, 2004
 (in %)

Age Group	(A)	(B)
	Men	Women
16-19	8.9	5.7
20-24	7.0	4.6
25-34	4.9	6.5
35-44	9.1	7.8
45-54	10.9	10.9
55-64	19.2	18.6
65-74	27.9	27.0
16+	11.4	11.1

Within each age group, except teenagers, the disability rate of Massachusetts adults in 2003-2004 was below that of their U.S. counterparts.¹⁰ (Table 3). In percentage point terms, the gaps in disability rates were largest for the older age groups; i.e., those 45-54, 55-64, and 65-74. Older adults in Massachusetts enjoyed larger advantages over their U.S. counterparts. We also compared the 2004 disability rates of Massachusetts adults in each of the seven age groups with those of their similar-aged counterparts in each of the other 50 states and the District of Columbia (Table 5). The disability rate of teens in Massachusetts ranked nearly right in the middle of the state distribution, with a ranking of 27th lowest. The state achieved much more favorable rankings for each of the other age groups. For the three oldest age groups, Massachusetts ranked second, seventh, and ninth lowest among the states in 2004.

¹⁰ The .2 percentage point difference between the disability rates of Massachusetts and U.S. teens was not large enough to be classified as statistically significant. The same is true of the differences in disability rates between those 20-24 and 25-34.

Table 5:
Incidence of Disability Rates Among Massachusetts Residents by
Age Group and the State's Ranking Among the 50 States and the District of Columbia, 2004

	(A)	(B)
Age Group	Incidence (in %)	State Ranking
16-19	7.4	Tied 27 th lowest
20-24	5.8	11 th lowest
25-34	5.7	9 th lowest
35-44	8.4	Tied 12 th lowest
45-54	10.9	Tied 2 nd lowest
55-64	18.8	Tied 7 th lowest
65-74	27.4	9 ^t lowest

Source: 2004 American Community Surveys, public use files, tabulations by authors.

Disability rates among Massachusetts residents during 2003-2004 varied quite considerably across educational attainment subgroups (Table 3). Nationally, research has consistently shown that better educated individuals typically enjoy better health, are less likely to work in industries with high accident rates (agriculture, construction, mining, key manufacturing industries), and have access to more economic resources to help overcome disability problems. Within our state, during 2003-2004, disability rates among the 16-74 year old population ranged from a low of 4% among persons with a Master's or higher degree to slightly over 14% for high school graduates and to a high of 23% for those who lacked a high school diploma/GED during those two years. The relative difference in disability rates between the best and least well educated adults in Massachusetts was more than five times.

The pattern of disability rates by educational attainment in Massachusetts was quite similar to that of the U.S. Disability rates among the U.S. population typically declined steadily and fairly sharply across educational attainment subgroups until the Bachelor's degree level was reached (Table 6). The disability rate of Master degree holders in the U.S. was slightly higher than that of Bachelor degree recipients (6.7% vs. 6.4%). Within each educational subgroup except high school dropouts, Massachusetts adults fared somewhat better than their national counterparts in avoiding disability problems, with the largest percentage point difference prevailing among those with a Master's or higher degree. Findings of a more disaggregated analysis of the sources of the lower overall disability rate among Massachusetts residents in

2003-2004 revealed that the higher levels of educational attainment among state residents were responsible for about 60 percent of the 2.1 percentage point difference in disability rates between the state and the nation.¹¹

Table 6:
Disability Rates of the 16-74 Year Old Population in
Massachusetts and the U.S., by Educational Attainment, 2003-2004
(in %)

	(A)	(B)	(C)
Educational Attainment	Massachusetts	U.S.	Massachusetts – U.S.
<12 or 12, no diploma	23.0	21.6	+1.4
H.S. diploma/ GED	14.2	15.3	-1.1
13-15 years	10.6	12.0	-1.4
B.A.	5.5	6.4	-.9
M.A. or higher	4.4	6.7	-2.3
All	11.3	13.4	-2.1

In each educational attainment level, except for those persons without a high school diploma or a GED, Massachusetts' ranking on disability rates among all 50 states and D.C. was one of the lowest in the U.S. (Table 7). For example, Massachusetts' rank stood at second lowest for disability rates among those holding a Master's or higher degree, 8th lowest among those with a Bachelor's degree, 11th lowest among those with some college, and 13th lowest among those with a high school diploma or GED. The state's high school dropouts do not fare as well. Their disability rate of 23% was only 30th lowest among the 50 states and D.C.

¹¹ Assigning the U.S. percentage shares of adults in each of the five educational subgroups to Massachusetts would yield an expected disability rate for our state of 12.6% versus the actual 11.3% rate for 2003-2004. Thus, 1.3 of the 2.1 percentage point gap between the disability rates of the state and nation was due to educational differences.

Table 7:
Massachusetts' Disability Rate Ranking Among the 50 States and
the District of Columbia by Educational Attainment Level, 2003-2004 Averages,
(in %)

Educational Attainment	Disability Rates (in %)	State Ranking
<12 or 12 Years, No Diploma	23.0	30 th Lowest
High School Diploma/GED	14.2	13 th Lowest
Some College	10.6	11 th Lowest
Bachelor's Degree	5.5	8 th Lowest
Master's or Higher Degree	4.4	2 nd Lowest

Source: 2003 and 2004 American Community Surveys (ACS), U.S. Census Bureau, tabulations by Center for Labor Market Studies.

Among members of the four major race-ethnic groups, Hispanics in Massachusetts had the highest incidence of disability problems (17%) followed by Blacks (13%), Whites (11%) and Asians (7%) (Table 3). For the entire nation, the incidence of disability problems was highest among Blacks (17%) followed by Whites (13%), Hispanics (11%) and Asians (7%). It is somewhat puzzling that the disability rate of Hispanics in Massachusetts was the highest among the four major race-ethnic groups, given their younger ages. Further investigation of the ACS data for Massachusetts revealed that 16-74 year old foreign born Hispanics were more likely to have reported a disability problem during 2003-2004 than their native born counterparts (18.3% versus 13.5%). The finding stands in sharp contrast to that for the entire nation. For the U.S., disability rates among native born Hispanics were higher than among foreign born Hispanics (11.6% versus 9.8%).

The disability rates of Asians, Blacks, Hispanics, and Whites by educational attainment level are displayed in Table 9. For all four race-ethnic groups, the disability rates of Massachusetts adults declined steadily and steeply with their level of schooling. Within each educational attainment group, however, Asians reported the lowest disability rates. The gaps between the overall disability rates of Whites and those of Blacks and Hispanics are primarily attributable to the higher educational attainment of Whites. Within most educational groups, Black-White differences in disability rates are typically small, and run in both directions. For example, in the two highest educational attainment categories, Blacks report lower disability

rates than Whites while Black dropouts were more likely than their White counterparts to report a disability.

Table 8:
Disability Rates of the 16-74 Year Old Population in Massachusetts by
Educational Attainment and Race-Ethnic Group, 2003 –2004
(in %)

	(A)	(B)	(C)	(D)
Educational Attainment	Asian	Black	Hispanic	White
<12 or 12, no diploma	18.4	25.2	26.4	22.4
H.S. diploma/ GED	12.5	14.3	15.4	14.3
13-15 years	3.6	12.2	7.8	10.8
B.A.	3.3	3.5	6.9	5.5
M.A. or higher	1.3	3.2	4.7	4.4
All	7.3	13.4	17.0	10.9

In Massachusetts, the native born and foreign born were equally likely to have reported disability problems (11%) (Table 3). But for the nation, the disability rate was much higher among the 16-74 year old native born population than it was among the foreign born (14% vs. 9%). The high disability rate among the foreign born in the state is somewhat puzzling, particularly given the young ages of immigrants and their higher levels of schooling in comparison to their U.S. counterparts.

Findings of a more disaggregated analysis of the disability rates of the native born and foreign born in Massachusetts and the U.S are displayed in Table 9. Among men in Massachusetts, the disability rate was slightly higher among the native born than the foreign born (11.5% vs. 10.4%) while the opposite is true for women. For both gender groups, however, the disability rates of the foreign born are higher in Massachusetts than in the U.S. In Massachusetts, the age patterns of disability rates among the foreign born and the native born are very similar, with disability rates rising steadily and strongly from age 25-34 to the top of the age distribution. In the younger age groups, the foreign born in our state are somewhat less likely to be disabled than their native born counterparts while the opposite holds true for the older age groups. In each age group, except 65-74 year olds, however, the foreign born in Massachusetts have higher disability rates than their U.S. peers with many of the differences quite large. As the foreign born

population of the state ages, this will place upward pressures on the size of the disabled population.

Table 9:
Comparisons of Disability Rates of the Native Born and Foreign Born in
Massachusetts and the U.S. by Gender and Age Group, 2003-2004 Averages
(in %)

Gender/Age Group	(A) Massachusetts		(B) U.S.	
	(1)	(2)	(1)	(2)
	Native Born	Foreign Born	Native Born	Foreign Born
Gender				
Men	11.5	10.4	14.1	8.2
Women	11.1	12.5	14.2	10.3
Age Group				
16-19	7.3	6.0	7.2	3.8
20-24	6.0	5.9	6.8	3.6
25-34	6.1	5.1	7.1	3.6
35-44	8.0	8.3	10.4	6.0
45-54	11.1	12.0	15.3	10.5
55-64	17.8	23.9	23.5	19.2
65-74	27.7	30.4	33.3	31.0

Predicting the Disability Status of Massachusetts Adults; Findings of a Logit Regression Analysis

The above analyses of the disability status of Massachusetts' adults in recent years examined variations in the incidence of disability problems among adults one trait at a time (age, gender) or by pairs of traits (race/ethnic origin and educational attainment). The likelihood of a given adult being disabled is likely to be a function of a multiple set of characteristics, including age, educational attainment, nativity status, race-ethnic origin, work history, and possibly gender.¹² We have used a multivariate statistical technique known as logit regression analysis to predict the effects of a variety of individual demographic/socioeconomic traits on the probability that an individual will be disabled and to predict the probability that a person with a given set of

¹² Past national research has shown that the likelihood of becoming disabled is also influenced by the nature of one's prior work experiences and overall health history, but the ACS survey does not provide information on either work histories (except for the prior year) or health histories.

demographic and educational traits will be disabled during a given year (2004).¹³ The 16 independent variables appearing in the regression model are listed and defined in Table 10. They include one gender, five age, four race-ethnic, four educational attainment, and two nativity variables. The base group for our analysis is a 20-34 year old, White female, who has a high school diploma, and was born in the United States.¹⁴

Table 10:
Definitions of the Variables Appearing in the Logit Regression
Model of the Disability Status of Massachusetts Adults, 16-74 Years Old in 2004

Variable	Definition
DISAB	A variable representing the disability status of the respondent = 1 if disabled at time of survey = 0 if not
MALE	A variable representing the gender of the respondent = 1 if male = 0 if female
AGE1619	A variable representing the age of the respondent = 1 if 16-19 = 0 if other age
AGE3544	A variable representing the age of the respondent = 1 if 35-44 = 0 if other age
AGE4554	A variable representing the age of the respondent = 1 if 45-54 = 0 if other age
AGE5564	A variable representing the age of the respondent = 1 if 55-64 = 0 if other age
AGE6574	A variable representing the age of the respondent = 1 if 64-74 = 0 if other age
Asian	A variable representing the race-ethnic origin of respondent = 1 if Asian = 0 if other

¹³ For a comparative review of the theoretical features and underlying statistical properties of linear probability and logit regression models, See: John T. Aldrich and Forrest D. Nelson, Linear Probability, Logit, and Probit, Sage Publications, Beverly Hills, California, 1984.

¹⁴ The dependent variable in the logit regression model is actually the log of the odds of being disabled. We apply a statistical formula to convert the findings of the regression model into predicted probabilities.

Table 10: Continued

Variable	Definition
Black	A variable representing the race-ethnic origin of the respondent = 1 if Black = 0 if other
Hispanic	A variable representing the race-ethnic origin of the respondent = 1 if Hispanic = 0 if other
Other	A variable representing the race-ethnic origin of the respondent = 1 if mixed or other race = 0 if other
Educ 1-12	A variable representing the educational attainment of the respondent = 1 if lacks high school diploma/GED = 0 if other
Educ 13-15	A variable representing the educational attainment of the respondent = 1 if completed 13-15 years of school = 0 if other
BA	A variable representing the educational attainment of the respondent = 1 if has a Bachelor's degree = 0 if other
MA or higher	A variable representing the educational attainment of the respondent = 1 if has a Master's or higher degree = 0 if other
Native born	A variable representing the nativity status of the respondent = 1 if native born = 0 if other
Established immigrant	A variable representing the nativity status of the respondent = 1 if foreign born and arrived in the U.S. prior to 2000 = 0 if other

The estimated coefficients from the actual logit regression model are displayed in Column A of Table 11 while Column B displays their estimated marginal effects on the probability of being disabled evaluated at the means of all right hand side variables and Column C displays the significant levels of these coefficients. The sign and size of the marginal probability effect for a given variable indicates how that variable would be expected to increase (decrease) the probability that an individual would be disabled, holding all other predictor variables constant. For example, the estimated marginal coefficient for the variable BA, which represents an individual holding a Bachelor's degree, was -.100 and was statistically significant at the .01 level. This finding implies that a Bachelor degree holder would be 10 percentage points

less likely to be disabled than an otherwise comparable individual who only completed 12 years of schooling.

Table 11:
Findings of the Logit Regression Analysis of the Probability
of a 16-74 Year Old Resident of Massachusetts Being Disabled in 2004

Variable	(A) Coefficient in Logit Model	(B) Marginal Probability Impact (at Means)	(C) Sig. Level
Constant	-3.360	--	.01
Male	.057	.006	Not sig.
Asian	.091	.009	Not sig.
Black	.365	.037	.01
Hispanic	.815	.082	.01
Other Race	.597	.060	.01
AGE 16-19	-.364	-.036	.01
AGE 35-44	.394	.039	.01
AGE 45-54	.781	.078	.01
AGE 55-64	1.313	.131	.01
AGE 65-74	1.781	.178	.01
Native born	.776	.078	.01
Established Immigrant	.360	.036	.05
ED 1-2	.700	.070	.01
ED 13-15	-.231	-.023	.01
B.A.	-.998	-.100	.01
M.A. or higher	-1.283	-.128	.01

All of the age, educational attainment, and nativity variables and three of the four race-ethnic variables appearing in the logit model were statistically significant. There was no significant effect of being male on the probability of a Massachusetts adult being disabled.¹⁵ Once an individual had passed the 20-34 age range, he was significantly more likely to be disabled, with the marginal probability of being disabled rising through the 65-74 age group. Those adults who had not graduated from high school were significantly more likely to be disabled than their otherwise identical peers who had graduated from high school. Those adults with levels of schooling beyond high school were significantly less likely to be disabled, with the marginal effects rising with each higher level of post-secondary schooling. The difference in the

¹⁵ In the national model, the coefficient on the male variable is positive and statistically significant, but the marginal probability effect is quite small, less than .2 percentage points.

expected probability of being disabled between a high school dropout and a M.A. or higher degree holder was a large 20 percentage points.

While being Asian had no significant, independent effect upon being disabled relative to whites (the base group), Blacks, Hispanics, and members of other races were significantly more likely to be disabled than White, non-Hispanics, with the Hispanic effect being a fairly large 8 percentage points, considerably higher than the one percentage point effect for Hispanics in the nation as a whole.

To illustrate how the findings of the logit regression model can be used to predict the probability of disability for persons with a given set of traits, we constructed four hypothetical individuals with varying sets of demographic and schooling traits. The first individual is a young, 25-34 year old, Asian male, with an M.A. degree who had immigrated to the U.S. prior to 2000. The predicted probability of this individual being disabled was only 1.6%, about one-seventh the probability of disability for the average adult in our state. Our second individual is a slightly older, 35-44 year old, Black female with a Bachelor's degree, who was born in the U.S. Her predicted probability of being disabled was only 5.6%, about one half the statewide average. Our third individual is an older 45-54 year old, white male, high school graduate who was born in the U.S. The predicted probability of this individual being disabled was 14.8 percent, which was about 30% higher than the statewide average. Our final individual is a more elderly 65-74 year old, Hispanic male immigrant, who lacked a high school education, and arrived in the U.S. in the early 1990s. This individual had a near 60 percent probability of being disabled, revealing the large combined effect of age, education, and being a Hispanic immigrant on the probability of being disabled in Massachusetts in 2004. Similar results prevailed in the logit regression model that was estimated for the U.S.; however, being Hispanic itself had a much lower impact on the probability of an adult being disabled in the U.S.¹⁶ A better understanding of the sharply higher disability rates among Hispanic adults in Massachusetts would be desirable, particularly given the growth of the Hispanic population and the adverse effects of being disabled on the employment and income status of Hispanic residents.

¹⁶ In the U.S. logit model, the independent impact of being Hispanic on the probability of an adult being disabled was only .4 percentage points versus 8.2 percentage points in Massachusetts.

Table 12:
Predicted Probability of Disability for Four Hypothetical Individuals in Massachusetts, 2004

Traits of Individual	Predicted Probability Of Being Disabled
Male, Asian, 25-34 years old, established immigrant, M.A. degree	.016
Female, Black, 35-44 years old, native born, B.A. degree	.056
White male, 45-54 years old, native born, high school diploma	.148
Male, Hispanic, 65-74 years old, established immigrant, high school dropout	.586

The Distribution of the Disabled Population by Geographic Area of the State

Since adult education, health services, vocational rehabilitation, and workforce development services are delivered at the local level, it would be desirable to obtain information on the distribution of the disabled population across substate areas, including counties and cities. The ACS public use files provided by the U.S. Census Bureau unfortunately do not contain substate geographic identifiers. The U.S. Census Bureau has, however, published a series of tables from the annual ACS surveys for selected variables in counties and large cities. For the 2003 and 2004 ACS surveys, the U.S. Census Bureau has provided estimates of the number and age/gender characteristics of the disabled population in eight counties of the state and two central cities (Boston and Springfield).¹⁷ We have organized the published data on disability status from the U.S. Census Bureau at the county level and the two central cities to produce estimates of the number of 16-74 year old disabled persons and the incidence of disability problems among the 16-74 year old population in 2003-2004 (Table 13).

The estimated number of disabled 16-74 year old persons in the eight counties of Massachusetts for whom data are made available ranged from 38,000 in Plymouth County to 87,000 in Middlesex County, the most populous county of the state. To generate estimates of the incidence of disability problems among the 16-74 year old population, we divided the number of disabled persons in this age group by the estimated population of 16-74 year olds in each county at the time of the 2003 and 2004 ACS surveys. Our findings on the incidence of disability

¹⁷ The city of Springfield is identified by the U.S. Census Bureau since it is in Hampden County, one of the initial ACS test sites that has an above average sampling ratio.

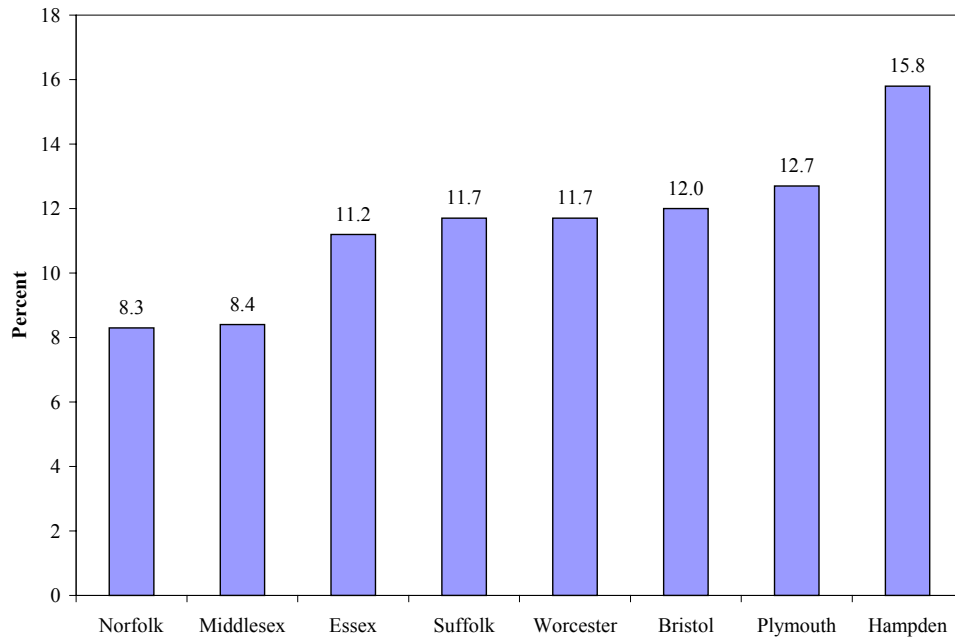
problems are displayed in Table 13 and Chart 3. The incidence of these disability problems ranged considerably across these eight counties, varying from lows of 8 percent in Middlesex and Norfolk Counties to a high of just under 16 percent in Hampden County. The high incidence of disability problems in Hampden County was influenced in part by a very high rate of disability problems among the residents of Springfield. Nearly 1 of 5 residents of Springfield reported a disability problem at the time of the ACS surveys. In the city of Boston, only 1 of 8 residents reported a disability problem.

Table 13:
The Disability Status of the 16-74 Year Old Population in
Massachusetts by Selected County and Central City, 2003-2004 Average

County/City	(A) Number of Persons 16-74	(B) Disabled 16-74 Year Olds	(C) Percent Disabled
Counties			
Bristol	383,806	46,209	12.0
Essex	512,881	57,687	11.2
Hampden	314,317	49,746	15.8
Middlesex	1,036,595	87,054	8.4
Norfolk	457,754	38,113	8.3
Plymouth	341,527	43,380	12.7
Suffolk	480,442	56,193	11.7
Worcester	536,8693	62,924	11.7
Cities			
Boston	404,531	50,072	12.4
Springfield	100,998	20,066	19.9

Source: U.S. Census Bureau, 2003 and 2004 ACS surveys, web site, www.census.gov, tabulations by authors.

Chart 3:
Percent of 16-74 Year Old Residents with a Disability by
County of Massachusetts, 2003-2004 Averages



The U.S. Census Bureau also provided estimates of the numbers of disabled persons 75 and older in each of these eight counties and two central cities. For the state as a whole, there were 182,280 persons 75 and older with a reported physical or mental disability in 2003-2004, representing 45% of all persons in this age group living in households in the state. Very high fractions of the 75 plus population were disabled in each of these eight counties of the state and both the cities of Boston and Springfield (Table 14). The lowest incidence of disability problems was in Norfolk County where 39% of the 75+ population were reported to be disabled. In the other seven counties, somewhere 43 and 50 percent of the more elderly members of the population were disabled (Table 14). Over the coming decade, the population of 75+ year olds will be rising at an above average rate in Massachusetts. Given the high incidence of disability problems among this age group, this demographic shift will increase the size of the state's disabled population and increase the demand for health care and rehabilitation services.

Table 14:
The Disability Status of Residents 75 and Older by Selected County and
Central City of Massachusetts, 2003-2004 Averages

	(A)	(B)	(C)
County/City	Number of Persons 75+	Disabled 75+	Percent Disabled
Counties			
Bristol	36,485	16,089	44.1
Essex	46,814	23,531	50.3
Hampden	32,042	15,237	47.5
Middlesex	85,485	37,923	44.3
Norfolk	43,496	17,103	39.3
Plymouth	25,291	12,659	50.0
Suffolk	33,932	16,798	49.4
Worcester	47,151	20,229	42.9
Cities			
Boston	27,697	13,481	48.7
Springfield	8,234	4,113	50.0

Types of Disabilities Experienced by the Disabled Adult Population in Massachusetts, New England and the U.S., 2003-2004

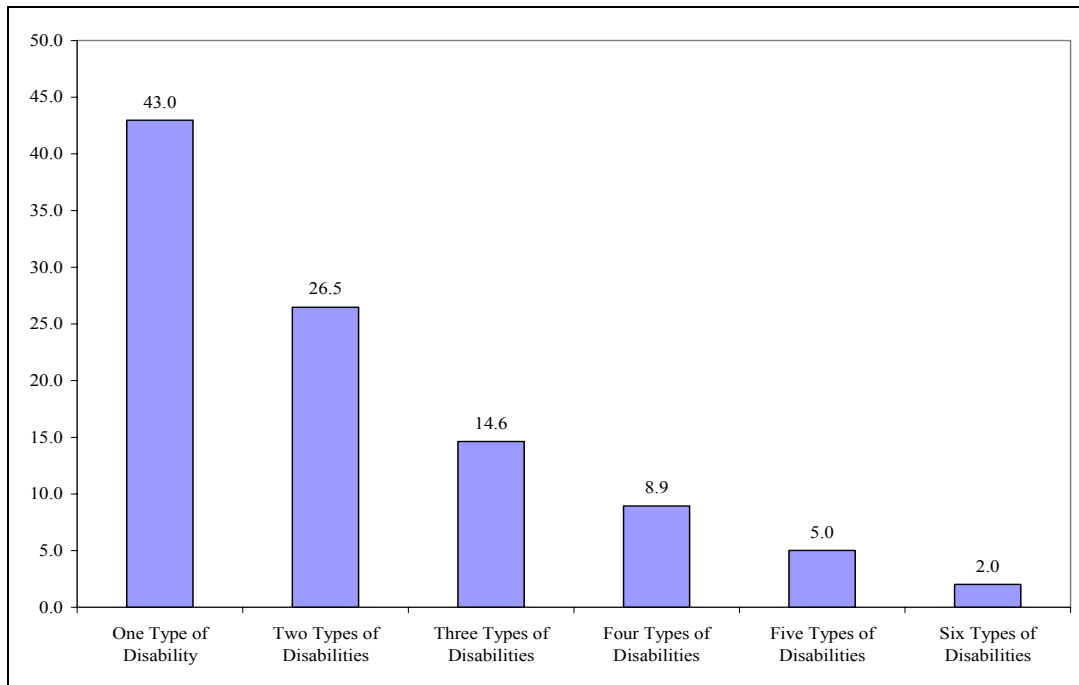
In completing the questionnaires used in the 2003 and 2004 ACS surveys, respondents were asked to identify the specific types of disabilities that they had recently experienced. There were six types of disabilities that respondents were asked to identify. Individuals could report having multiple disabilities. The size categories of self-reported disabilities were the following:

1. Difficulty working at a job or business
2. Difficulty Dressing
3. Vision/Hearing Disability
4. Difficulty Going Outside the Home
5. A Disability that Limits Physical Activities
6. Difficulty Learning, Remembering, or Concentrating

A respondent may have identified multiple disabilities; e.g., difficulty learning, remembering and difficulty working at a job or business. In Massachusetts, 43% of all 16-74 year old disabled persons cited only one type of disability (Chart 4). Slightly more than 26%

cited two types of disabilities and the remaining 31% cited three or more types of disabilities. Seven percent of the disabled reported five or six disabilities.

Chart 4:
Percent Distribution of 16-74 Year Old Disabled Persons in
Massachusetts by Number of Disabilities Reported, 2003-2004, Averages



The number of 16-74 year olds in Massachusetts, New England, and the U.S. reporting a specific type of disability in 2003-2004 are displayed in Table 15. In Massachusetts, allowing multiple responses, there were 1.08 million cases of disabilities reflecting the multiple types of disabilities cited by the state's 509,000 disabled persons. Of the six different types of disabilities in Massachusetts, work disability and physical difficulty were the most frequently cited categories. They accounted for 28% and 26%, respectively, of all disabilities combined. The other disabilities cited by Massachusetts respondents were difficulty remembering (16%), difficulty going out (12%), vision/hearing disability (10%) and difficulty dressing (7%). Findings on the distribution of disabilities by types of disabilities in New England and the U.S. were very similar to that of Massachusetts.

Table 15:
Number and Percent Distribution of Disabilities Reported by 16-74 Year Olds in Massachusetts, New England, and the U.S., by Type of Disability, 2003-2004 Averages

State	Number			Percent Distribution		
	(A)	(B)	(C)	(A)	(B)	(C)
	Mass.	New England	U.S.	Mass.	New England	U.S.
Work Disability	308,108	681,751	15,461,962	28.5	27.2	26.1
Difficulty Dressing	74,252	179,094	4,497,154	6.9	7.1	7.6
Vision/Hearing Disability	107,364	269,208	6,668,984	9.9	10.7	11.2
Difficulty Going Out	131,686	290,090	6,785,280	12.2	11.6	11.4
Physical Difficulty	284,466	687,225	17,027,990	26.3	27.4	28.7
Difficult Remembering	176,155	403,044	8,904,104	16.3	16.1	15.0
All Disabilities Combined	1,082,031	2,510,411	59,345,472	100.0	100.0	100.0

Source: 2003 and 2004 American Community Surveys (ACS), U.S. Census Bureau, tabulations by Center for Labor Market Studies.

Estimates of the percent of 16-74 year olds citing each type of disability in Massachusetts, New England, and the U.S. during 2003-2004 are displayed in Table 16. Massachusetts' rankings among the 50 states and D.C. for each type of disability are also displayed in this table. Nearly 7% of 16-74 year olds in Massachusetts reported a work disability problem, followed by a physical disability (6.3%), difficulty learning or remembering (3.9%), difficulty going out (2.9%), a vision or hearing disability (2.4%), and finally difficulty dressing (1.7%) (Table 16). The pattern of findings for Massachusetts was highly consistent with that for New England and the U.S. While Massachusetts ranked 8th lowest among the 50 states for the overall disability rate, it ranked only 18th lowest among the 50 states and the District of Columbia in the work disability rate and 16th lowest in difficulty going out. Its ranking was better on the other four measures: 12th lowest in difficulty remembering, 7th lowest in difficulty dressing, 5th lowest in physical activity difficulty, and 3rd lowest in vision/hearing disability.

Table 16:
Disability Rates Among the 16-74 Year Old Population in
Massachusetts, New England, and the U.S., Total and by Types of Disability
(2003-2004 Averages)

	(A)	(B)	(C)	(D)	(E)
Types of Disability	Massachusetts	New England	U.S.	Mass. – U.S	Mass. Rankings Among 50 States and District of Columbia
All	11.3	11.9	13.4		8 th Lowest
Work Disability	6.9	6.8	7.6		18 th Lowest
Difficulty Dressing	1.7	1.8	2.2		7 th Lowest
Vision/Hearing Disability	2.4	2.7	3.3		3 rd Lowest
Difficulty Going Out	2.9	2.9	3.3		16 th Lowest
Physical Difficulty	6.3	6.9	8.4		5 th Lowest
Difficult Remembering	3.9	4.0	4.4		12 th Lowest

Source: 2003 and 2004 American Community Surveys (ACS), U.S. Census Bureau, tabulations by Center for Labor Market Studies.

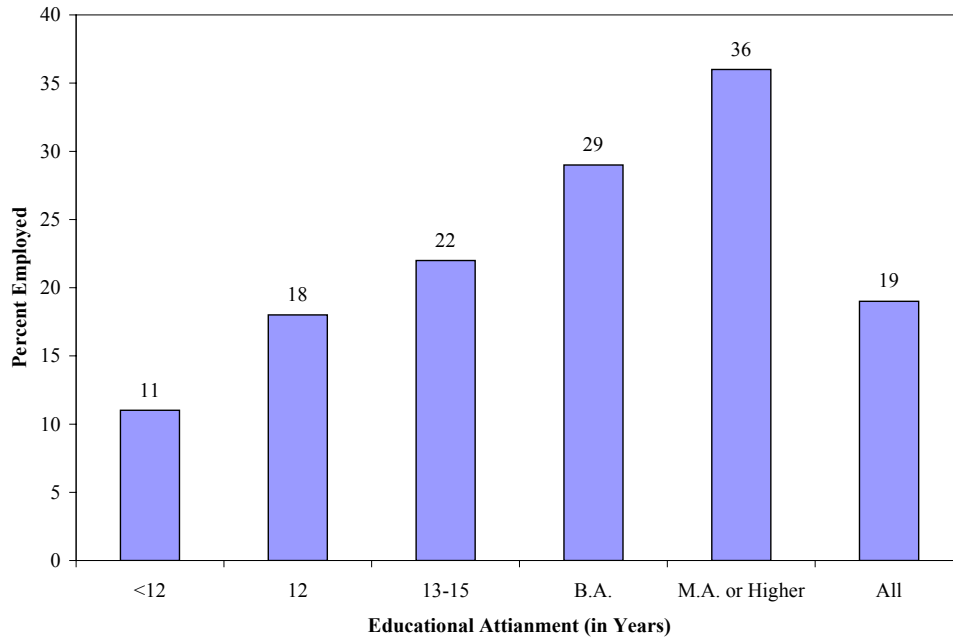
Knowledge of the types of disability problems reported by the disabled in Massachusetts during 2003-2004 is also important from a labor market and workforce development perspective as well. An analysis of the employment status of the disabled population 16-64 years old by the type of disability reported on the ACS survey yielded the set of employment rates displayed in Table 17. The estimated employment rates of the non-elderly disabled varied quite widely by type of disability. They ranged from lows of 15 percent among those citing difficulties in dressing and 18 percent among those reporting difficulties in going out or in working to a high of 46 among those with a vision or hearing difficulty (Table 17). The relative difference in employment rates among the disabled from top to bottom of the distribution was three to one.

Table 17:
Employment Rates of 16-65 Year Old Disabled Adults in
Massachusetts by Type of Disability Reported, 2003-2004 Averages

Type of Disability	Employment Rate (in %)
Difficulty Dressing	15.5
Difficulty Going Out	18.4
Employment-related	18.6
Difficulty Remembering	29.4
Physical Difficulty	30.2
Vision/hearing difficulty	45.8

The employment status of the disabled citing employment-related disabilities was examined separately by their educational attainment to determine whether schooling influenced their success in finding a job. Overall, only 19 percent of those who reported disabilities influencing their ability to work were employed at the time of the 2003-2004 ACS surveys. The employment rates of this category of the disabled varied considerably across the five educational attainment categories. The higher the level of schooling of the disabled, the more likely they were to be working. Their employment rates ranged from a low of 11% among those who lacked a regular high school diploma/GED to 22% for those who completed 1-3 years of post-secondary schooling and to a high of 36 percent among those with a Master’s or higher degree. The less well educated disabled appear to face far more severe difficulties in securing any type of employment, reflecting the weaker labor market position of the less-well educated in the entire population of the state. Some combination of education, job training, and intensive support services may well be needed to improve their labor market position in the near future in our state.

Chart 5:
Employment Rates of 16-65 Year Old Persons with a
Self-Reported Employment Disability by Educational Attainment
in Massachusetts, 2003-2004 Averages



Projecting the Size of the Adult Disabled Population in Massachusetts to 2015

All of the above analyses of the size and demographic characteristics of the disabled population in Massachusetts and the U.S. were based on findings for recent years. Public policymaking on disability issues and the planning of programs for the disabled also should be based on projections of the future size and age composition of the disabled population. How many persons in Massachusetts are likely to report some form of physical, mental, or employment disability over the next ten years? What are the likely characteristics of the future disabled population? To answer these key research questions, we have carried out several projection and simulation exercises to generate estimates of the size and age distribution of the disabled 16-74 year old population in our state over the time period, 2004-2015.

Given the movement of the post-World War II baby boom generation into the ranks of the 55-74 year old population, the adult population of the state will experience a substantial graying over the coming decade. The earliest members of the baby boom generation turned 55

years old in 2001, and they will turn 65 in 2011.¹⁸ The much higher numbers of adults in the baby boom generation will sharply increase the size of the 55-74 year old population of the state over the next ten years. Given the much higher disability rates that have prevailed among the state's older population in recent years, the graying of the Commonwealth's population can be expected to considerably raise the number of adults with a disability problem by 2015 in the absence of a sustained and sharp improvement in the health of the older population.

Our first set of projections of the disabled population in Massachusetts for 2015 is based on a demographic cohort methodology that assumes that the disability rates that prevailed in 2004 for men and women in each of seven age groups will remain unchanged over the decade. We begin by projecting the future size of the resident population by age group and gender from 2004 through 2015. These population projections are based on estimates of the U.S. Census Bureau. The seven age groups used in the analysis are the following

- | | |
|---------|---------|
| • 16-19 | • 45-54 |
| • 20-24 | • 55-64 |
| • 25-34 | • 65-74 |
| • 35-44 | |

Between 2004 and 2015, the U.S. Census Bureau projects that the 16-74 year old population of Massachusetts will rise from 4.693 million to 4.996 million, a gain of 303,105 or 6.4% (Table 18). This population projection is based on the assumption that the high levels of domestic migration out of Massachusetts that occurred during recent years will be substantially reduced over the decade. During the past two years, the overall resident population of Massachusetts (all ages) has been estimated to have declined, the only state in the nation with such an adverse demographic outcome.

¹⁸ The baby boom generation is typically defined as those persons who were born between 1946 and 1964. For a more detailed analysis of the impacts of the aging of the baby boom generation on the projected graying of the Massachusetts population and labor force, See: Leonel Arana and Andrew Sum, The Graying Labor Force, Research and Evaluation Brief, Volume 3, Issue 3, March 2006, The Commonwealth Corporation, Boston, 2006.

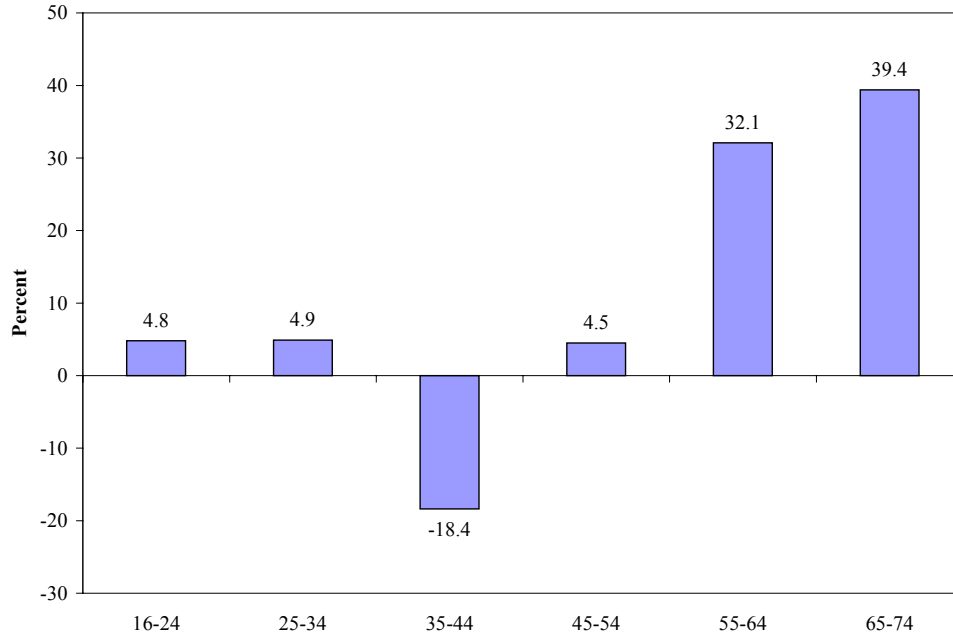
Table 18:
Estimated 2004 and Projected 2015 Resident Population of
Massachusetts 16-74 Years Old by Age Group

	(A)	(B)	(C)	(D)
Age Group	2004 (Est.)	2015 Proj.	Absolute Change	Percent Change
16 – 19	357,073	348,634	-8,439	-2.3
20 – 24	430,814	477,596	46,782	+10.8
25 – 34	857,592	899,957	42,365	+4.9
35 – 44	1,037,476	846,105	-191,371	-18.4
45 – 54	947,010	989,38	42,375	+4.5
55 – 64	656,642	867,690	211,048	+32.1
65 – 74	406,616	566,961	160,345	+39.4
16 – 74, Total	4,693,223	4,996,328	303,105	+6.4

Source: U.S. Census Bureau, population projections by state, web site, calculations by authors.

The growth rates of the resident population of Massachusetts are projected to vary considerably by age group over the coming decade. Several age groups, including 16-19 year olds and 35-44 year olds, are projected to experience an actual decline while the number of 55-64 and 65-74 year olds will rise substantially by somewhere between one-third and forty percent (Table 18). Persons 55-74 will increase in numbers by 371,400, accounting for more than all of the net increase in the population of the state's 16-74 year olds over the 2004-2015 period (Chart 6).

Chart 6:
Projected Growth Rates of the 16-74 Year Old Population in
Massachusetts by Age Group, 2004 – 2015
(in %)



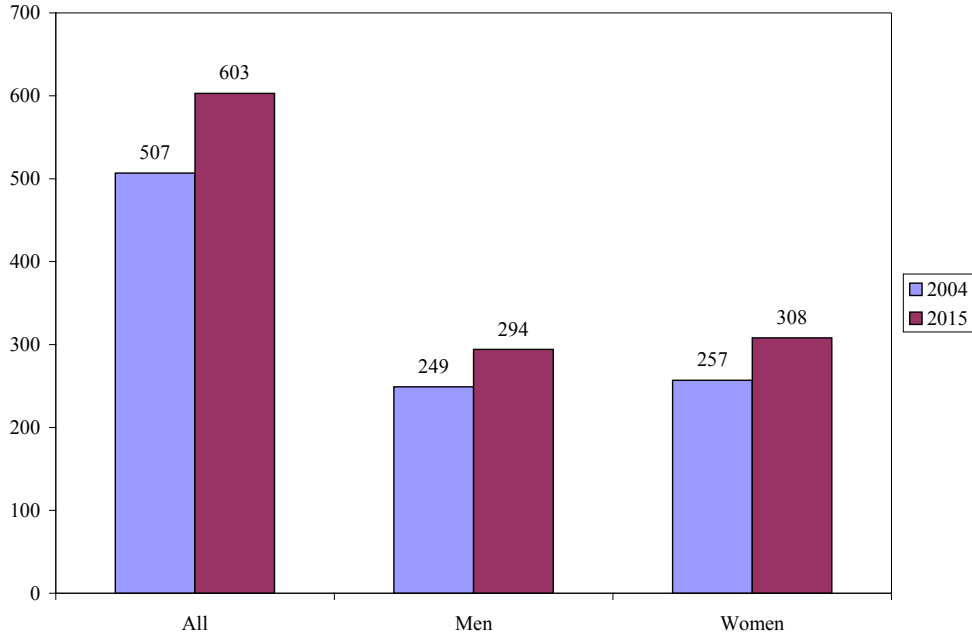
To project the number of disabled residents in the year 2015, we multiplied the projected number of persons in each age/gender cell (14 such subgroups) in 2015 by their disability rate at the time of the 2003-2004 ACS surveys, and then summed the findings across each of these 14 subgroups (Table 19). The key assumption underlying these projections of the disabled population is that the disability rate within each age/gender subgroup of the 16-74 year old population will remain unchanged over the decade. Disability rates in 2004 varied markedly across age groups, ranging from a low of 5.7% among 20-24 and 25-34 year olds to a high of 27% among 65-74 year olds. An aging of the population over time will, *ceteris paribus*, increase the size of the disabled population of the state and the nation. Our projections of the number of disabled adults by age group and gender in the year 2015 are displayed in Table 19, together with estimates of the change in the disabled population over the 2004-2015 time period.

Table 19:
The Projected Resident Population and Disabled Population of
Massachusetts 16-74 Years Old in 2015 by Gender and Age Group

	(A)	(B)	(C)	(E)	(E)	(F)
Gender/ Age Group	Projected Population 2015	Disability Rate 2004	Number of Disabled In 2004	Projected Disabled In 2015	Absolute Change in Disabled Population 2004-2005	Percent Change In Disabled Population
Male						
16-19	172,553	8.9%	12,827	15,331	2,504	19.5
20-24	234,754	7.0%	12,801	16,476	3,675	28.7
25-34	442,469	4.9%	20,338	21,622	1,284	6.3
35-44	406,965	9.1%	45,539	37,066	-8,473	-18.6
45-54	481,339	10.9%	49,932	52,610	2,678	5.4
55-64	414,725	19.2%	59,091	79,712	20,621	34.9
65-74	255,931	27.9%	48,880	71,388	22,508	46.0
Total	2,408,736	11.4%	249,408	294,205	44,797	18.0
Female						
16-19	176,081	5.7%	7,447	10,089	2,642	35.5
20-24	242,842	4.6%	8,516	11,134	2,618	30.7
25-34	457,488	6.5%	28,446	29,784	1,338	4.7
35-44	439,140	7.8%	41,034	34,160	-6,874	-16.8
45-54	508,046	10.9%	52,682	55,271	2,589	4.9
55-64	452,965	18.4%	6,224	82,491	21,267	34.2
65-74	311,030	27.0%	57,065	83,929	26,864	47.1
Total	2,587,592	11.1%	257,414	307,858	50,444	19.6
Total						
16-19	348,634	7.4%	20,274	25,765	5,491	27.1
20-24	477,596	5.8%	21,317	27,656	6,339	29.7
25-34	899,957	5.7%	48,784	51,461	2,677	5.5
35-44	846,105	8.4%	86,573	71,289	-15,284	-17.7
45-54	989,385	10.9%	102,614	107,880	5,266	5.1
55-64	867,690	18.8%	121,315	163,194	41,879	34.5
65-74	566,961	27.4%	105,945	155,326	49,381	46.6
Total	4,996,328	11.2%	506,822	602,571	95,749	18.9

Sources: (i) U.S. Census Bureau, State Population Projections by age group; (ii) 2004 American Community Surveys, public use files, tabulations by authors.

Chart 7:
Comparisons of the 2004 Actual and 2015 Projected Number of Disabled
16-74 Year Old Persons in Massachusetts, Total and by Gender
(in 1000s)



Given the assumptions underlying the projections of the disabled population of the state over the coming decade, there would be 603,000 disabled individuals 16-74 years old residing in the state in 2015 (Table 19 and Chart 7). This would represent an increase of nearly 100,000 disabled adults or nearly 19 percent. The bulk of the projected increase in the disabled population would come from those persons ages 55-74 whose overall numbers will be rising rapidly over the coming decade. Over 91,000 of the additional number of disabled adults would come from those in the 55-74 age group. In comparison, there would be only modest increases in the number of disabled persons in the 16-34 and 45-54 age groups and an actual decline in the number of disabled 35-44 year olds due to a shrinking population in this age group.¹⁹ Both the male and female disabled population of the state would rise to a considerable degree over the next 10 years in the absence of any substantive reduction in disability rates within age groups. The male disabled population is projected to rise by close to 45,000 or 18% while the female disabled population would grow by 50,000 or close to 20% over the 2004-2015 period.

¹⁹ This population group would have been born between 1971 and 1980 and included many members of the baby bust generation who were born between 1965 and 1976. Members of this birth cohort also migrated out of state in the recessionary early years of the 1990s and in the past four years, 2001-2005.

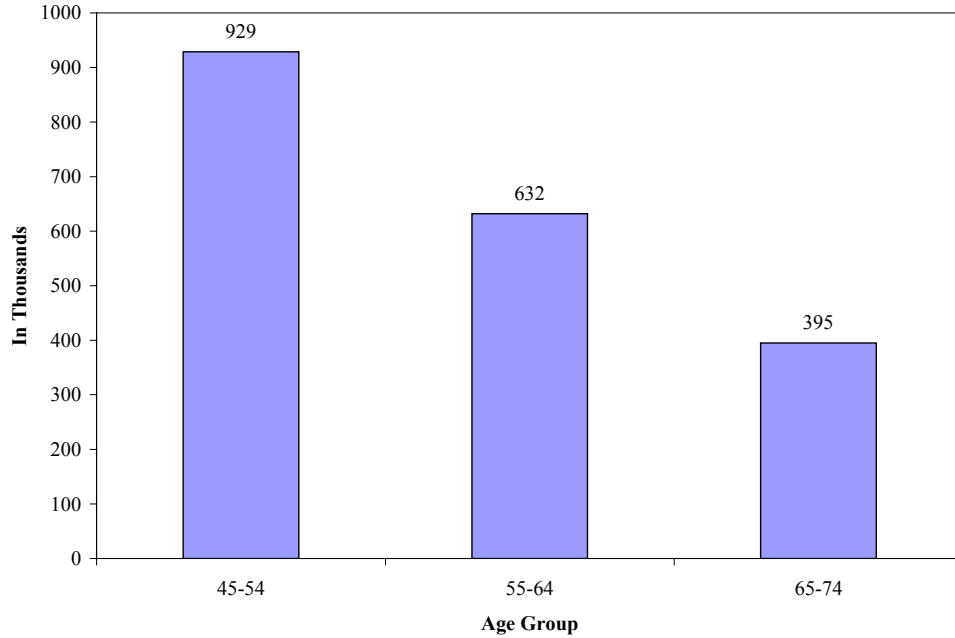
An identical methodology was used to project the size of the nation's disabled population in 2015. Between 2004 and 2015, the number of disabled persons ages 16-74 in the U.S. is projected to increase from 27.4 million to 33.5 million, a rise of 6.1 million or 22%. Over 90 percent of the rise in the nation's disabled population would be generated by the older population 55-74 years old. The demand for rehabilitation services could increase markedly in both the nation and the state over the coming decade. Improving the physical/mental well-being of the older, disabled population and their employability also can help boost the future growth of the labor force and the employed population and strengthen the economic growth potential of the national and state economies.

The Improved Human Capital Traits of the Older Population and Their Potential Impacts on the Growth of the Disabled Population

The projected high rate of growth in the state's disabled population over the coming decade may be somewhat exaggerated due to the fact that the coming entrants into the ranks of the older population (55-74) are better educated than the group of adults who will be leaving this age cohort over the next ten years. As revealed earlier in the paper, the human capital traits of the older population can play a key role in influencing the likelihood that they will become disabled. Thus, a better educated older population may help slow the future growth of the state's disabled population.

The coming pool of entrants into the 55-74 age group in Massachusetts is considerably larger than the pool of individuals who will be aging out of this cohort over the coming decade (Chart 8). In 2003-04, the number of 65-74 year olds living in households in the state was estimated to be slightly under 400,000. The number of 45-54 year olds residing in the state at the time of the 2003-2004 ACS surveys was more than twice as large at 929,000. This age cohort will be 56-65 years old in 2015.

Chart 8:
The Number of Massachusetts Residents in Households in the
45-54, 55-64, and 65-74 Age Groups in 2003-2004
(in Thousands)



Source: 2004 American Community Surveys, public use files, tabulations by authors.

The members of the 45-54 age cohort were better educated than the 65-74 age cohort in 2003-2004. Less than 9 percent of the state's 45-54 year olds lacked a regular high school diploma or a GED certificate versus 22 percent of those residents in the 65-74 age group (Table 20). Nearly 64 percent of the 45-54 year olds had completed at least one year of post-secondary schooling versus only 44 percent of the 65-74 year olds, and nearly 4 of every 10 of the state's 45-54 year olds held a Bachelor's or more advanced academic degree versus only 1 of 4 of those in the 65-74 age group.

Table 20:
The Percentage Distribution of the 45-54, 55-64, and 65-74 Year Old
Population of Massachusetts by Educational Attainment, 2003-2004

	(A)	(B)	(C)
Educational Attainment	45 – 54	55 – 64	65 – 74
<12 or 12, no diploma or GED	8.8	13.2	22.1
High school diploma / GED, no college	26.6	29.3	34.0
13 – 15 years, including Associate’s degree	25.4	24.9	19.3
Bachelor’s degree	21.9	15.6	12.5
Master’s or higher degree	17.2	17.0	12.0
Bachelor’s or higher degree	39.1	32.6	24.5

Source: 2003-2004 ACS surveys, public use files, tabulations by authors.

The disability rates of the state’s older population (55-64 and 65-74) fell steadily and typically quite strongly as their educational attainment improved (Table 21). For example, among 55-64 year olds, the disability rates in 2003-2004 ranged from a high of 38 percent among those lacking a regular high school diploma to lows of 11 and 7 percent, respectively, for those holding a Bachelor’s and Master’s or higher degree. Among 65-74 year olds, the differences in disability rates across education groups were somewhat smaller in size but still quite substantial, varying from lows of 17 percent among those with a Bachelor’s or higher degree to a high of just under 40 percent for those lacking a regular high school diploma or a GED certificate. As the 45-54 year old cohort moves into the ranks of the 55-74 age group over the decade, their superior average level of schooling should help push down the overall disability rate among this age group, thereby ameliorating somewhat the projected growth in the overall size of the disabled adult population of the state between 2004-2015.

Table 21:
Percent of 55-64 Year Olds and 65-74 Year Olds in Massachusetts that
Were Disabled by Educational Attainment, 2003-2004 Averages

Educational Attainment	(A)	(B)
	55 – 64	65 – 74
<12 or 12, no diploma	38.2	39.6
H.S. diploma, GED	22.0	30.0
13-15 years, including Associate’s degree	17.4	26.1
Bachelor’s degree	11.4	17.2
Master’s or higher degree	7.1	16.7
All	18.8	28.2

Source: 2003-2004 ACS surveys, public use files, tabulations by authors.

To estimate the potential impacts of a better educated older population on the growth of the state’s older disabled population over the coming decade, we conducted the following hypothetical simulation exercise. First, we estimated the number of disabled 55-74 year olds that there would be in 2014 if the disability rates of 55-64 year olds and 65-74 year olds remained unchanged at their 2004 values. Each age cohort was simply aged 10 years in conducting this simulation.²⁰ Second we then simulated the number of disabled 55-74 year olds in 2014 by multiplying the number of persons in each of five educational attainment subgroups in each of the two age groups by the age/education specific disability rates for these two age groups in 2004. This second simulation allows the improved educational attainment of older workers to lower the projected disability rate. The five educational attainment subgroups used in conducting this simulation were the following:

- Lacks high school diploma/GED
- High school graduate or GED, but no completed years of post-secondary schooling
- 13-15 years, including Associate degree holders
- Bachelor’s degree
- Master’s degree or higher

Under the first simulation, the number of disabled 55-74 year olds in Massachusetts would rise from 230,000 in 2004 to nearly 353,000 in 2014 (Table 22). The projected rise in the older disabled population would be 122,520, representing an increase of 53% over the decade.

²⁰ This assumes no loss in the population of each age group due to deaths or out-migration. It also ignores the effects of immigration into the state of older persons from abroad. Losses due to deaths and out-migration to other states will exceed the gain in immigration from abroad.

Table 22:
Estimating the Impact of the Aging of the 45-64 Year Old Population on
the Older Disabled Population in Massachusetts Under Two Alternative Scenarios

Age Group/Year	(A) Scenario A, disability rates for each age subgroup remain constant, no adjustment for educational attainment changes	(B) Scenario B, assumes that each educational subgroup in each age subgroup faces the same disability rate as its earlier age cohort
2003-2004		
55-64	118,955	118,955
65-74	111,196	111,196
Total, 55-74	230,151	230,151
2014		
55-64	174,567	161,140
65-74	178,106	164,089
Total, 55-74	352,671	325,229
Change in Number of Disabled		
55-64	55,612	42,185
65-74	66,908	52,893
Total, 55-74	122,520	95,078
Percent Change, 2004-2014	53.2%	41.3%

Under the second scenario, the improved educational attainment of the older population will help moderate the growth of the pool of older disabled individuals. The number of disabled older individuals will rise from 230,000 in 2004 to slightly over 325,000 in 2014. The projected rise in the disabled population is still quite large, being equal to 95,000 individuals, representing an increase of 41%. These findings, thus, clearly indicate that, despite a higher average level of schooling among the newer entrants into the pool of older residents, there is quite likely to be a very large rise in the number of disabled older persons (55-74) in the state over the coming decade. They will account by far for the largest share of the projected rise in the entire adult disabled population. Addressing the needs of this aging, disabled population will pose a formidable challenge to the state's health, vocational rehabilitation, and workforce development

systems. The surge in the disabled older population will be taking place simultaneously with a substantial graying of the state's labor force.²¹

Summary of Key Findings and Their Public Policy Implications

This research report has been devoted to a description and analysis of the size, demographic/socioeconomic characteristics, and geographic locations of the disabled adult population (16-74 years old) in Massachusetts in recent years. Findings for Massachusetts also were compared to those of the disabled populations of New England and the entire nation. A summary of key findings of the study and a brief discussion of their public policy implications are presented below.

First, during calendar years 2003-2004, there were, on average, 509,000 persons ages 16-74 in Massachusetts who reported some type of disability problem. This group of disabled individuals accounted for 11.3% of the state's population of 16-74 year olds versus just under 12% in New England and 13.4% in the nation. Massachusetts ranked 8th lowest among the 50 states on this disability measure in 2003-2004.

Second, women comprised a slight majority (52%) of the disabled population in Massachusetts in 2003-2004. Nearly 8 of every 10 disabled adults were White, non-Hispanic while Hispanics accounted for 10 percent and Blacks slightly more than 6 percent of the state's disabled population. Relatively few of the disabled adults were under 25 years of age (8%), primarily reflecting the low incidence of disability problems among teens and 20-24 year olds while two-thirds of the disabled were between 45 and 74 years of age. Adults who failed to graduate from high school or obtain a GED certificate comprised a disproportionate share of the state's disabled (28%) while those holding a Bachelor's or more advanced degree accounted for only 15% of the state's disabled. Immigrants accounted for nearly 1 of 5 disabled in the state, nearly twice their share of all disabled adults in the nation.

Third, Massachusetts men and women experienced a nearly identical incidence of disability problems in 2003-2004. Disability rates, however, varied far more considerably across race-ethnic, educational attainment, and age groups. Asians (7%) were the least likely to report a disability problem while Hispanics (17%) and persons of mixed race (18%) were most likely to

²¹ See: Andrew Sum and Leonel Arana, The Graying of the Massachusetts Labor Force, The Commonwealth Corporation, Boston, February 2006.

report a disability problem.²² Disability rates are lowest for young adults 20-24 and 25-34 years of age and rise steadily thereafter, peaking at 28% for those persons 65-74. The incidence of disability problems among Massachusetts adults declined steadily and steeply with their level of educational attainment. Nearly 1 of 4 adults who failed to graduate from high school were disabled versus only 4 to 5 of every 100 adults with a Bachelor's or higher degree. Links between educational attainment and the incidence of disability problems were strong among men and women, members of each major race-ethnic group, and across age groups.

Fourth, disability rates for 16-74 year olds varied quite widely across the eight counties of the state for whom ACS data were available. These disability rates ranged from lows of 8 percent in Middlesex and Norfolk Counties to a high of 16 percent in Hampden County. One of five adult residents of the city of Springfield reported a disability versus only 1 of 8 adult residents in the city of Boston.

Fifth, findings of a multivariate statistical analysis of the likelihood of a Massachusetts adult being disabled revealed that the age, educational attainment, race-ethnic origin, and nativity status of adults significantly influenced the probability of their being disabled. Gender and being Asian had no significant independent effects on the likelihood of an adult in Massachusetts being disabled.

Sixth, many of the disabled adults in Massachusetts reported multiple disabilities in the ACS surveys. Overall, 58% of the disabled reported two or more types of disabilities. There was a particularly strong degree of overlap between those persons reporting a disability that affected their ability to work and other types of disabilities. Persons reporting a work-related disability also were considerably less likely to be employed than most of their peers reporting other types of disabilities. The educational attainment of those reporting a work disability had a powerful impact on the likelihood of their being employed at the time of the 2003 and 2004 ACS surveys.

Seventh, the aging of the State's baby boom generation (those born between 1946 and 1964) is projected to have a substantial impact on both the growth and age composition of the state's disabled population over the coming decade. Between 2004 and 2015, the number of

²² Asians also were the least likely to report a disability problem in the U.S. The disability rate of Asians in Massachusetts (7.3%) was identical to that of the nation. Some analysts have argued that cultural factors may play some role in accounting for the considerably lower rate of reported disabilities among Asians, but their high educational attainment also reduces their disability rates. In the regression model for Massachusetts, the coefficient on the Asian variable was not statistically significant.

Massachusetts adults that are projected to be disabled in the absence of any improvement in age-specific disability rates will rise by approximately 96,000 or 19%. The number of disabled adults in the 55-74 age group will rise by somewhere between 40 to 45 percent over the decade even taking into account their improved educational attainment. These large increases in the size of the older, disabled population will have substantial consequences for the state's health care system, the vocational rehabilitation system, and the costs of the Medicaid program, the fastest growing cost element of the state's budget.

Eighth, a high fraction of the state's older disabled population were jobless in 2003-2004. The aging of the state's working-age population will place severe constraints on the growth of the resident labor force unless the labor force attachment of the older population (55-74), including disabled persons, is strengthened. The ability of the state's vocational rehabilitation system, the WIA workforce development system, and the community college system to respond to the needs of the older worker and disabled population needs to be assessed and strengthened. Previous evaluations of the job training programs of the Massachusetts Rehabilitation Commission have revealed that the investments in these programs raise the annual earnings of program participants sufficiently to justify the resources invested in the disabled. A strengthened workforce development system for the disabled could help increase the size of the state's resident labor force, the number of employed persons, the real output of the state economy, and state and federal tax revenues as well as reduce poverty, income dependency, and cash and in-kind outlays for the jobless and dependent.

Appendix A: Comparing Disability Estimates for Massachusetts from the 2000 Census of Population and Housing With Those from the 2004 American Community Surveys

All of the estimates of the numbers and characteristics of disabled adults in Massachusetts appearing in this report are based on the findings of the American Community Surveys for calendar years 2003 and 2004. Disability data are also collected from a number of other household surveys, including the 2000 Census of Population and Housing and the monthly Current Population Survey. Our analyses of the size and characteristics of the disabled population rely primarily upon the ACS surveys for calendar years 2003 and 2004 rather than the 2000 Census since our analyses of the 2000 Census data as well as that of other disability researchers reveal that the 2000 Census questions on disability produced an exaggerated estimate of the disabled population due to mis-reporting by some respondents.²³ The changes in the layout of the disability questions and skip patterns beginning with the 2003 ACS survey are believed to be responsible for the lower estimates from the 2003 and 2004 ACS Surveys in comparison to those from the 2000 Census of Population and Housing.²⁴ A set of recommendations for altering the definition of the disabled for use in analyzing the data from the 2000 Census of Population and Housing will be provided at the end of this appendix.

Estimating the Disabled Population of Massachusetts in 2004

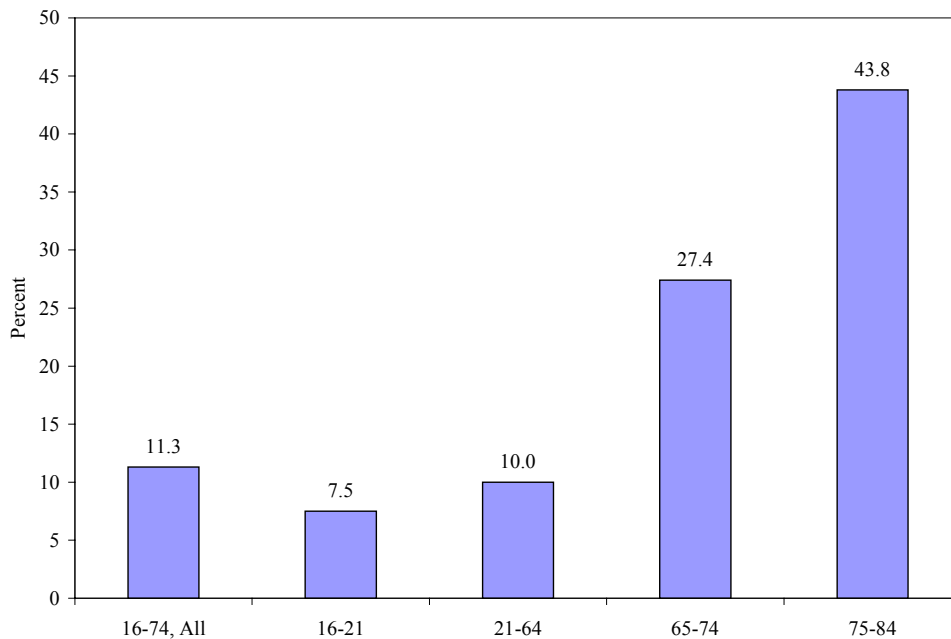
Using the standard definition of the disabled population cited in the text, we estimated the number of 16-74 year old residents of Massachusetts who reported a physical or mental disability at the time of the 2004 ACS surveys in our state. Our estimate of the number of disabled 16-74 year olds from the ACS surveys for 2004 indicate that slightly over one-half of a million (507,000) Massachusetts residents ages 16-74 experienced a disability in 2004, representing

²³ For a review of the national findings on this issue, See: Sharon Stern and Matthew Brault, "Disability Data from the American Community Survey: A Brief Examination of the Effects of a Question Redesign in 2003," U.S. Census Bureau, Housing and Household Economic Statistics Division, Washington, D.C., 2005.

²⁴ Robert R. Weathers, A Guide to Disability Statistics from the American Community Survey, Cornell University, Rehabilitation Research and Training Center on Disability Demographics and Statistics, Ithaca, May 2005.

11.3% of the state's resident, household population in that age group.²⁵ In comparison, 13.4% of the U.S. population of 16-74 year olds reported a disability in 2004. Our state ranked 8th lowest among the 50 states and D.C. on this incidence of disability measure. The disability rates for individual states ranged from lows of 10.1 to 10.9 per cent in Connecticut and Hawaii to highs of 20.5 to 23.2 percent in Mississippi, Arkansas, and West Virginia. In a separate research paper, we attempt to identify through regression techniques the impacts of the age distribution of a state's population, the educational attainment of the residents of the state, and its industrial characteristics (share of jobs in construction, mining, manufacturing) on the estimated share of its population with a disability.

Chart 1:
Percent of the Massachusetts 16-74 Year Old Household Population that
Were Disabled by Age Group, 2004



As illustrated in the main body of this paper, disability rates in Massachusetts in 2004 rose with the age of the respondent, increasing from 7.5% among those 16-21 to 10% among those 21-64 to a high of slightly over 27% among those 65-74 (Chart 1). If we extend the upper age range to include those 75-84 years old, the percent disabled rises to nearly 44%. The labor

²⁵ As noted in the text, the ACS survey does not conduct interviews with residents of group quarters, including nursing homes, mental hospitals, jails, prisons, or college dormitories.

market attachment of this last age group is quite low; thus, they have been excluded from most analyses.

When we apply the same definition of the disabled to the 2000 Census public use data for Massachusetts, we obtain the following estimates of the size and age distribution of the 16-74 year old disabled population of the state.

Table 1:
Number and Percent of the 16-74 Year Old Population of
Massachusetts that Were Disabled in 2000, Total and by Selected Age Group

	(A)	(B)
Age	Number of Disabled Persons	Disabled as a Percent of the Resident Population
16-74, all	863,692	19.1
16-21	72,146	14.6
21-64 ⁽¹⁾	671,812	18.1
65-74	132,338	31.9

Source: 2000 Census of Population and Housing PUMS files, tabulations by authors.

Note: The 21 year olds are included in both the 16-21 and the 21-64 year old subgroups.

The disabled population of 16-74 year olds in Massachusetts at the time of the 2000 Census was estimated to be nearly 864,000, representing slightly over 19% of the population in this age group. This group of disabled was 70 percent larger than the disabled population in the same age group at the time of the 2004 ACS survey. Not only was this group considerably larger in size, but the members of this disabled group were much more likely to be employed at the time of the 2000 Census than they were in 2004. Our estimate of the overall employment rate of the 16-74 year old disabled population in 2000 was nearly 53% versus an employment rate of only 30% among the disabled at the time of the 2004 ACS. Similar findings occurred when we analyzed the 2000 Census and 2004 ACS data for the U.S. The 2000 disabled population in Massachusetts was, thus, not only much larger in size, but much more employable, indicating a very employable group was mis-reporting itself as disabled on the 2000 Census questionnaire.

In a research paper on this topic, staff in the U.S. Census Bureau's Housing and Household Economic Statistics Division argued that changes in the layout of the disability question and the skip patterns in the 2003 and 2004 ACS surveys seem to be primarily

responsible for the differences in results.²⁶ In the 2000 Census long-form questionnaire, there were only two questions on disability, with subparts C and D of question 16 asking the respondents to only answer the question on their ability to go outside the home or to work “if they were 16 years old or over”. The authors of the U.S. Census Bureau working paper claim that some respondents misinterpreted the instructions and filled in the answer “yes” to these two questions on the basis of their age (16 or older) or employment status not on their disability status. The 2000 Census, thus, exaggerated the pool of disabled and vastly overstated their employability. Many non-disabled, working people answered the question incorrectly. The U.S. Census Bureau, thus, recommends strongly that researchers not directly compare the 2000 Census or 2000-2001 ACS findings with those for the 2003 and 2004 ACS surveys. While we have complied with their recommendations, we believe that we can modify the use of the 2000 Census disability data to make the analyses more comparable to the 2003 and 2004 ACS survey data especially on the labor market experiences of the employed disabled population.

The patterns of responses to the first four questions on disability in the 2000 Census and the 2004 ACS were quite similar for both the state and the nation. In Table 2, we present our estimates of the share of the 16-74 year old population that reported a disability on the 2000 Census long-form questionnaire and the 2004 ACS questionnaire based on their responses only to the first four questions. We also display the estimated employment rates for these two groups of disabled at the time of both surveys. The employment rate is measured by the employment/population ratio (E/P). For Massachusetts, the estimated percentage-share of the 16-74 year old population that were disabled in both years on this more restrictive criterion were within .5 percentage points of each other (Table 2). Similar findings applied to the estimates for the U.S. as a whole. The gap between these two disability shares for the nation was also .5 percentage points, with the ACS survey yielding a slightly higher disability rate.

²⁶ See: Sharon Stern and Matthew Brault, op.cit.

Table 2:
The Percent of the 16-74 Year Old Population in Massachusetts and the
U.S. that were Disabled in 2000 and 2004 Based on Responses to the First
Four Questions on Disability and Their Employment Rates at the Time of the Two Surveys

Group	Massachusetts			U.S.		
	(A) 2000	(B) 2004	(C) Percentage Point Difference	(A) 2000	(B) 2004	(C) Percentage Point Difference
Percent Disabled	10.2	9.7	-0.5	11.6	12.1	+0.5
Employment Rate of the Disabled (in %)	32.8	31.8	-1.0	32.2	32.1	-0.1

The employment rates of the disabled under this definition were approximately identical in both years in both the state and the nation. In Massachusetts and the U.S., slightly under one-third of both groups were employed. Thus, our proposed analyses of the 2000 Census data will focus primarily on those individuals who cited a disability under one of the first four categories while the 2003 and 2004 ACS analyses will be based on all those persons citing a disability under any of the six categories. This revised analysis of the 2000 Census data will be far more legitimate. The wealth of data on the labor market experiences of the disabled from the 2000 Census can, thus, be successfully mined, especially the data on the industries of the firms employing the disabled and the occupational characteristics of their jobs.