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Are the Young Becoming More Disabled?

Appendix

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HEALTH

Appendix

NHIS, 1984-1996

In the 1984-1996 NHIS surveys, individuals were asked the following question: "Because of any impairment or health problem, does ___ need the help of other persons with personal care needs, such as eating, bathing, dressing, or getting around this home?" If they answered no to this question, they were then asked: "Because of any impairment or health problem, does ___ need the help of other persons in handling routine needs, such as everyday household chores, doing necessary business, shopping, or getting around for other purposes?" Based on her response to the latter question, a respondent is classified as being: (1) unable to perform personal care needs; (2) limited in performing other routine needs; or (3) not limited in personal care or routine needs.

The personal care questions in the 1984-1996 NHIS surveys are asked of all people over age 60, and all individuals aged 5-59 who report being "limited in their major activity." This raises an important issue, because individuals under 60 are not asked about personal care limitations unless they report an activity limitation. There are two sets of activity limitation questions: those based on "ability to work," and those based on ability to perform the individual's "major activity." From the

first questions, individuals are grouped into one of four categories: (1) Unable to work; (2) Limited in Kind/Amount of Work; (3) Limited in Other Activities; (4) Not Limited. Individuals in any of the first three categories are taken to have an activity limitation. The "major activity" limitation data depend on the "major activity" that an individual reports: (1) Working; (2) Keeping House; (3) Going to School; (4) Something Else. Based on this major activity, individuals are then asked if they are limited in performing it, and are thus grouped into four categories: (1) Unable to perform major activity; (2) Limited in Kind/Amount of Major Activity; (3) Limited in Other Activities; (4) Not Limited. These questions differ from the work-limitation questions only for individuals who report "something else" as their major activity; these are primarily elderly individuals, although this category spans all ages.

These activity limitation questions are problematic in several ways; indeed, these are the reasons we do not use them as our primary measure of disability. First, the work-limitation questions may be influenced by incentives for a person to be in or out of the labor force. Suppose that more attractive disability insurance causes a person to drop out of the labor force, even though his health remains the same. This issue is

particularly relevant in light of recent research on the growing incentives for disability insurance (Nelson 1994; Bound and Waidmann 2001; Autor and Duggan 2003). Therefore, the individual may only be asked the personal care questions once he drops out of the labor force, even though his health has not changed. To assess this bias, we examined growth in disability for the group of employed people, who are not subject to these forces. Disability growth is very similar for this group as well. The second problem concerns the ability of people to report an activity besides the standard working, going to school, or keeping house. This will have an impact on the sample of people asked the personal care question if the "something else" activity is more strenuous than working, and the individual is unable to perform it. Fortunately, the opposite seems to be true: individuals unable to work seem to report a less strenuous activity as their major activity.

For our purposes, the key issue is whether the screener question on activity limitation significantly impacts our estimated rates of disability. The effects appear to be quite modest. We analyzed samples where all individuals were asked both the activity limitation questions and the personal care limitation questions. These include: 60-69 year-olds from 1984 to 1996, and all sample adult respondents from 1997 to 2000. We

estimated rates of personal care limitation first using all the data, and second by treating as nondisabled all those who report no activity limitation. By definition, rates of disability were higher using the first method, but the differences amounted to only 2 or 3 percent (not percentage points). This issue also affects the comparability of the 5-59 year-olds (who are screened) and the 60-69 year-olds (who are not screened). Because the screening seems to have modest effects, we treat these populations as essentially comparable, although the comparisons should be viewed with caution since, strictly speaking, the estimates of disability are constructed from different sample frames.

For the sake of completeness, we also report trends in the activity limitation measure. These are reported in Table 2. Rates of activity limitation increase for 18-29 year-olds, and 40-49 year-olds. They are essentially flat for 30-39 year-olds and 50-59 year-olds, and decline for 60-69 year-olds. These results provide another reason why the increase in personal care limitations cannot simply be a mechanical reflection of an increase in the proportion of the people asked about their personal care

We should also note one common problem with the personal care limitation questions themselves. These raise an issue

concerning the availability of "assistance." Individuals with better access to assistance will be more likely to report disability. While the issue is complex, declining household sizes suggest that assistance is becoming scarcer. According to Census data (www.census.gov), in 1970, the average household size was 3.14 persons; in 1980, this fell to 2.76 persons, to 2.63 persons in 1990, and to 2.59 persons in 2000. This effect may be partially or completely offset by the increasing availability of aids for the disabled. A definitive investigation of the way assistance informs statistics on disability for the young would require data of much greater detail than the NHIS.

Finally, we should note one change in data collection procedures during the early set of NHIS surveys: in 1995, the number of primary sampling units increased from 198 to 358, as a result of stratification at the state-level.

NHIS, 1997-2000

In the later years of the survey, the NHIS assesses the existence of a personal care limitation by asking: "Because of a mental, physical, or emotional problem, does _____ need the help of other persons with personal care needs, such as eating, bathing, dressing, or getting around this home?" Previously, respondents were asked to report difficulties that resulted from

"any impairment or health problem." The new wording of the question is at the same time more inclusive (by incorporating mental or emotional problems) and more specific than "any impairment." It is hard to know what effect this change in wording would have on reports of disability, and this is an important reason not to compare disability statistics across the two sets of NHIS surveys. The question for routine needs limitation differs from the earlier question in an analogous way: "Because of a mental, physical, or emotional problem, does ___ need the help of other persons in handling routine needs, such as everyday household chores, doing necessary business, shopping, or getting around for other purposes?"

In addition to the different phrasing of the disability questions, there are also analogous differences in the activity limitation questions. Individuals are asked whether a "physical, mental, or emotional problem" keeps them from working at a job or business, limits them in the kind or amount of work they can do, or limits them in any activities.

There are also differences in the sampling procedure from 1997 onwards. Prior to 1997, the disability questions are asked of all adults over age 60, but only to those 5-59 year-olds that report some limitation of their activity. From 1997 onwards, they are asked of all adults. To make the sampling frame

consistent, therefore, we consider as non-disabled those respondents that, in the 1997-2000 period, report a personal care or routine needs limitation, but no limitation of activity (in practice, this has virtually no effect on our estimates, increasing them at most by 2-3 percent).

The 1997 changes in wording are only part of the redesign, which was quite fundamental. Prior to 1997, the first disability-related question asked whether respondents were limited in the kind or amount of work they could do. After the redesign, however, the first question concerned whether their health limited them in routine or personal care needs. Changes in question order could have substantial effects on the answers given to follow-up questions, although the direction of change is not always clear.

There are also a few broad methodological differences between the 1997-2000 NHIS surveys and the earlier NHIS surveys. The recent surveys are collected using a computerized data entry system, while the earlier surveys were collected by hand. Finally, the recent surveys oversample both blacks *and* Hispanics, while the earlier surveys oversampled only blacks. (One exception is the 1992 NHIS, which also oversampled Hispanics. We use the NHIS sampling weights to adjust for the oversample.)

Institutionalization and the NHIS

One limitation of the NHIS is that it excludes the institutionalized population. If the total number of disabled people remains constant, but disabled nursing home residents are being relocated to the community, the rate of disability in the NHIS would rise, even though the actual rate of disability in the population is constant. However, we have found that changes in institutionalization—measured using the National Nursing Home Surveys—cannot be responsible for more than one-fifth of the aggregate trend growth, at the very most.

In particular, we estimated the impact of de-institutionalization on our disability estimates by using the National Nursing Home Survey (NNHS), which is an ongoing survey of nursing homes and their residents. It has been conducted in 1973, 1977, 1985, 1995, 1997, and 1999. We use the 1985, 1995, and 1999 surveys. The sampling unit is the nursing home, but in each sampled nursing home the NNHS also randomly samples up to six patients who were reported to be residents of the facility at midnight on the day prior to the survey date. The NNHS also provided a patient-level sampling weight that allows the researcher to estimate the nationwide current nursing home population. Since the NNHS also collects data on patient's

ages, it is possible to construct age-specific estimates of this population.

Table 3 shows the change in institutionalization estimated from the NNHS. It is clear that the rate of institutionalization is falling, so that disabled people may well be relocating from facilities to the community. However, consider the most extreme case, where every person leaving an institution is unable to attend to personal care needs. Even in this case, "de-institutionalization" explains at most twenty percent of the total change in the proportion of people with personal care limitations; for those under age 39, it explains much less. On average, for all age groups between 18 and 60, it explains a little more than 15% of the change. Considered in the larger context of people who are unable to attend to their routine needs, de-institutionalization explains even less. The maximum proportion it explains is about 8 percent, for 55-59 year-olds, but on average it explains well under five percent of the total growth.

It is important to situate Table 3 in the broader context of research on institutionalization. Other researchers using Census data find rates of institutionalization that are roughly comparable for the over 60 population and under 18 population, but are quite a bit higher in the intermediate age ranges

(Crimmins, Saito et al. 1989). The figures from Census years are not directly comparable with our two years, but the discrepancies are probably too large to attribute to time trends. Most probably, they arise because the NNHS uses a more restrictive definition of an institution than the Census. In particular, it excludes schools for the mentally or physically handicapped, as well as mental and psychiatric hospitals. Since these types of institutions could well be releasing their patients into the community and raising the disability rates, it is important to consider these alternative estimates. According to the Census figures, rates of de-institutionalization from 1980 to 1990 for all age groups cannot explain more than one-third of the total change in routine needs disability rates, and for many age groups, it explains less than ten percent (Crimmins, Saito et al. 1989).

Estimating Means and Variances

Since the NHIS employs a complex sample design, it is not appropriate to compute means and variances as if it were a random sample. Use of the NHIS population weights allow us to construct unbiased means. To construct unbiased estimates of variances and (in the case of regressions) standard errors, we use information on the NHIS sample stratum and primary sampling unit. In particular, we used STATA's svymean (for means), and

svyreg (for regressions) commands, along with the NHIS variables for primary sampling unit and sample stratum. For both theoretical and practical reasons, we chose to treat each NHIS year as an independent sample, so that the total number of strata in the pooled sample is equal to the sum of all strata in individual years. Theoretically, there is no overlap across NHIS years, so the independence assumption seems reasonable. From a practical standpoint, the NHIS does not report its strata consistently across years; this makes it impossible to identify respondents in the same strata across two different years. This rules out the only alternative strategy, of matching strata across different years of the NHIS.

Adjusting for Composition Effects

To adjust our numbers for changes in the composition of the population, we first estimate the following regression model separately for every age group, and for each of the two NHIS subperiods:

$$Disab_{it} = \beta_0 + \beta_1 White_{it} + \beta_2 Male_{it} + \beta_3 Hispanic_{it} + \beta_4 Employ_{it} + \beta_5 Sch + \beta_6 Year_t + \varepsilon_{it} \quad (1)$$

The dummy variable $Disab_{it}$ is one if individual i reports a personal care or routine needs disability at time t. $White_{it}$ is one for whites; $Male_{it}$ is one for males, and $Hispanic_{it}$ is one for

Hispanics. $Employ_{it}$ represents a set of eight dummy variables for employment status, which can take on one of four values: (1) Worked in the past two weeks; (2) Has job, but did not work in the past two weeks; (3) Looking for work; (4) Not in the labor force. The employment status controls allow us to explore the possibility—mentioned earlier—that trends in disability are influenced by incentives to leave the labor force. The variable Sch_{it} represents a set of dummies for the individual's education group, which can take on one of four values: high school dropout, high school graduate, college attendee, and college graduate. (This variable is based on years of schooling. Those with less than 12 are considered to be high school dropouts; those with exactly 12 are considered high school graduates; those with greater than 12 but less than 16 are college attendees, and those with at least 16 are college graduates.) Finally, $Year_t$ is a set of year dummies: there are twelve in the first subperiod, and three in the second. The coefficients on the $Year_t$ dummies can be used to calculate the growth in disability that would have occurred holding the other variables constant. The t-statistics associated with the $Year_t$ coefficients then allow us to calculate whether these composition-adjusted trends are statistically significant. As mentioned above, all point estimates are constructed using the NHIS sample weights,

and all regression standard errors (and t-statistics) are estimated accounting for its stratified sample design using svyreg in STATA.

Estimating the Effect of Obesity

For each age group, the effect of obesity is calculated according to the following procedure. Denote the 1990 disability rates for the obese and non-obese as $Disab^{90}_{Obese}$ and $Disab^{90}_{Non-Obese}$. Denote the rate of obesity in year Y as $Obese^{Y}$. We calculate obesity's contribution as:

$$\left[\left(Obese^{96} - Obese^{84}\right)\left(Disab^{90}_{Obese} - Disab^{90}_{Non-Obese}\right)\right] +$$
$$\left[Obese^{90}\left(Disab^{96}_{Obese} - Disab^{84}_{Obese}\right) - \left(Disab^{96}_{Non-obese} - Disab^{84}_{Non-obese}\right)\right]$$

The term in the first square brackets represents the effect of shifting the newly obese people into the more disabled category of obesity. It is computed as the increase in the prevalence of obesity multiplied by the additional disability suffered by the obese. We calculate this additional disability using the intermediate year of 1990. The term in the second square brackets accounts for the fact that this additional disability increased over time. Therefore, among those already obese, more people became disabled than among the non-obese population. This component is equal to the prevalence of obesity in the

intermediate year of 1990, multiplied by the excess growth of disability among the obese.

APPENDIX REFERENCES:

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Table 1: Age-specific trends in Obesity and Routine Needs Disability, 1984-2000.

		Age Groups				
		18-29	30-39	40-49	50-59	60-69
Obesity Prevalence	1984	697	1176	1470	1591	1453
	1985-1986	764 **	1246 *	1552 *	1687 *	1620
	1987-1988	854 **	1313 **	1654 **	1764 **	1664
	1989-1990	945 **	1376 **	1739 **	1872 **	1735
	1991-1992	1059 **	1541 **	1862 **	2067 **	1903
	1993-1994	1235 **	1645 **	2088 **	2233 **	2066
	1995-1996	1431 **	1877 **	2234 **	2388 **	2231
	Change: 84-96	734	701	764	797	778
	1997-1998	1686	2072	2492	2802	2440
	1999-2000	1775	2413 **	2680 **	3058 **	2704 **
	Change: 97-2000	88	341	187	255	264
Disability Among Obese	1984	171	173	381	547	1141
	1985-1986	179	237 *	395	641	995
	1987-1988	193	226	320	569	1108
	1989-1990	139	220	351	608	1035
	1991-1992	167	285 **	419	749 **	1063
	1993-1994	163	311 **	487 *	700 **	1143
	1995-1996	210	281 **	410	698 **	1039
	Change: 84-96	40	109	29	151	-102
	1997-1998	132	155	364	584	767
	1999-2000	144	144	355	532	700
	Change: 97-2000	13	-11	-8	-51	-67
Disability Among Non-Obese	1984	76	111	183	372	732
	1985-1986	65	109	162	380	743
	1987-1988	69	111	177	319 *	659 *
	1989-1990	81	112	200	302 **	644 **
	1991-1992	93 *	152 **	210	369	633 **
	1993-1994	96 **	160 **	215 *	409	724
	1995-1996	79	158 **	240 **	376	684
	Change: 84-96	3	48	58	4	-48
	1997-1998	49	89	167	289	481
	1999-2000	55	85	167	244	426
	Change: 97-2000	5	-4	0	-45	-56

Sources: National Health Interview Surveys, 1984-2000

* indicates significant difference between indicated year and base year (1984 or 1997-8) at the 10% level

** indicates significant difference between indicated year and base year (1984 or 1997-8) at the 5% level

Table 2: Rate of Any Activity Limitation per 10,000 people.

	Age Groups				
	18-29	30-39	40-49	50-59	60-69
	Any Limit	Any Limit	Any Limit	Any Limit	Any Limit
1984	620	1012	1354	2257	3629
85-86	617	997	1379	2277	3586
87-88	628	927 **	1413	2140 **	3393 **
89-90	658 *	967	1438 *	2144 *	3378 **
91-92	706 **	1043	1535 **	2231	3327 **
93-94	746 **	1117 **	1606 **	2293	3457 **
95-96	727 **	1048	1537 **	2303	3271 **
change 84-96	107	36	183	46	-358
97-98	493	757	1139	1815	2422
99-00	450	658 **	1114	1666 **	2185 **
change 97-2000	-44	-99	-25	-150	-237

Sources: National Health Interview Surveys, 1984-2000.

* indicates significant difference between indicated year and base year (1984 or 1997-8) at the 10% level

** indicates significant difference between indicated year and base year (1984 or 1997-8) at the 5% level

Table 3: Age-Specific rates of institutionalization per 10,000 population, 1985-1999.

	Institutionalization Rate			Change	
Age Group	1985	1995	1999	1985-95	1995-99
18-29	2	1	1	-1	0
30-39	4	2	2	-2	0
40-49	6	3	3	-3	0
50-59	7	4	5	-3	1
60-69	11	6	8	-5	2

Sources: Population data from Bureau of Census Web Site, (www.census.gov).
Nursing Home Resident data from 1985, 1995, and 1999 National Nursing Home Surveys.