

Issues with Measuring Activities Associated with Seeing and Hearing Across National Surveys

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Abstract

National surveys have been producing estimates of activity limitations associated with seeing and hearing for many years, yet, estimates across surveys are often different. National estimates of activity limitations associated with sensory functioning from the National Health Interview Survey, the Medical Expenditure Panel Survey, and the Medicare Current Beneficiary Survey are compared. We explore potential reasons for why differences in estimates exist. Differences may be due in part to how the questions are asked: e.g., whether asking about the amount of trouble one has or asking about difficulty in specific tasks. While efforts have been undertaken to recommend standardized measures, question differences still exist. Discussion will focus on the value of reasonable consistency among sensory activity questions across surveys and suggestions for facilitating that process.

Key Words: MEPS, NHIS, MCBS, disability, activity limitations, seeing, hearing, blind, deaf, NHDR

1. Introduction

Determining estimates of persons with seeing and hearing activity limitations is important for public health planning purposes. U.S. Censuses and national surveys have been asking (in different ways) about seeing and hearing for many years. How one asks about seeing and hearing reflects different concepts and produces different estimates. The results in this paper are partially based on work of the Disability Work Group of the AHRQ's National Healthcare Disparities and Quality Reports.

1.1 Background

The National Healthcare Disparities Report (NHDR) and the National Healthcare Quality Report (NHQR) have been produced by the Agency for Healthcare Research and Quality (AHRQ) since 2003 in accordance to legislation enacted by the US Congress. According to this legislation AHRQ is to report national trends in the quality of healthcare and

prevailing disparities in health care delivery as it relates to racial and socioeconomic factors in priority populations which includes individuals with disabilities.

The 2003-2006 NHDR reports contained limited sections on disabilities in their priority populations sections of these respective reports. Because AHRQ wanted to include more information about individuals with disabilities in these reports, AHRQ with the assistance of the Interagency Subcommittee on Disability Statistics (ISDS) of the Interagency Committee on Disability Research (ICDR), brought together an interagency Disability Work Group with as much overlap as possible of the ISDS and the NHDR/NHQR Interagency Work Group. The goal for this Work Group was to develop a measure of disability for use in the NHDR that used existing data and that would be compatible across the national surveys that are used in the NHDR. In comparing survey questions and estimates across the domains of disability of the International Classification of Functioning, Disability and Health, the Work Group found large differences in question wording and estimates for the questions associated with seeing and hearing activity limitations (under Purposeful sensory experiences (d110-d129) in Chapter 1 Learning and applying knowledge of the Activities and Participation component of the International Classification of Functioning, Disability and Health (ICF).)

1.2 Objective

The objective of this paper is to provide and compare items/questions about seeing and hearing from U.S. Censuses, the American Community Survey, the Medical Expenditure Panel Survey (MEPS), the National Health Interview Survey (NHIS), and the Medicare Current Beneficiary Survey (MCBS). In addition, estimates of persons with seeing and hearing activity limitations are provided and compared using the MEPS, the NHIS, and the MCBS.

1.3 Methods

The Medical Expenditure Panel Survey (MEPS) is designed to provide nationally representative annual estimates at both the individual and family level of health care use and expenditures, access to care, patient satisfaction, health status, and insurance coverage for the U.S. civilian noninstitutionalized population. The MEPS survey permits the identification of persons with disabilities including those with seeing and/or hearing activity limitations and allows for analyses of the health care interactions that characterize them over a 2-year period. The primary sponsor of the MEPS is the Agency for Healthcare Research and Quality. For our analyses, data are restricted to those ages 65 and over living in the community.

The National Health Interview Survey's (NHIS's) primary purpose is to monitor the health of the nation. It is designed to provide nationally representative annual estimates at both the individual and family level of health status, health care use, and insurance coverage for the U.S. civilian noninstitutionalized population. The primary sponsor of the NHIS is the National Center for Health Statistics, Centers for Disease Control and Prevention. For our analyses, data are restricted to those ages 65 and over.

The Medicare Current Beneficiary Survey (MCBS) is designed to determine health insurance coverage, expenditures, and sources of payment (including co-payments and deductibles) for all services (including non-covered services) used by Medicare beneficiaries. It is a nationally representative sample of the Medicare population sponsored by the Office of Strategic Planning of the Centers for Medicare & Medicaid

Services (CMS). For our analyses, data are restricted to those ages 65 and over living in the community.

2. Results

2.1 Seeing and Hearing Questions/Items from Selected U.S. Censuses and Current Questions from the American Community Survey

As a first step we reviewed questions about seeing and hearing from past U.S. Censuses, using the U.S. Census publication "The U.S. Census publication Measuring America: The Decennial Census from 1790 to 2000." We began our review with the 1830 Census, the first Census with a consistent format across the United States. Additionally, for years after 2000, we add the questions from the American Community Survey whose annual estimates replace those previously produced by the Census long form.

In 1830 and 1840, enumerations were obtained of white persons and "slaves and colored persons," who were both deaf and dumb for the age groups under 14 years, 14 and under 25, and 25 years and upward. Additionally enumerations were obtained of "White persons" and "slaves and colored persons," who were blind. For the 1850 and 1860 Censuses, the category title was "Whether deaf and dumb, blind, insane, idiotic, pauper, or convict" with instructions to the assistant marshal to insert the term "Deaf and dumb," "blind," "insane and idiotic," opposite the name of such persons. The category title for the 1870 census was "Whether deaf and dumb, blind, insane, or idiotic." Enumerator instructions indicated that "Total blindness . . ." is intended; "Deafness merely, without the loss of speech, is not to be reported."

While earlier censuses enumerated persons who were blind or deaf and dumb, there was a shift in focus with the 1880 census. The 1880 census was activity based and its questions about seeing and hearing were enumerated as reasons for being unable to attend to the person's ordinary duties. The 1880 Census category title is: "Is the person [on the day of the enumerator's visit] sick or temporarily disabled, so as to be unable to attend to ordinary business or duties? If so, what is the sickness or disability?" The response options to choose from were: Blind; Deaf and Dumb; Idiotic; Insane; Maimed; crippled, bedridden, or otherwise disabled.

The 1890 Census questions about seeing and hearing reverted back to asking about specific defects rather than their being reasons for being unable to attend to the person's duties as in the 1880 census. The 1890 Census asked "Whether defective in mind, sight, hearing or speech, or whether crippled, maimed, or deformed, with name of defect." The 1910 Census similarly asked about specific defects with two items asking separately "Whether blind (both eyes)," and "Whether deaf and dumb." There were no seeing or hearing items in the 1900 Census nor for the Censuses from 1920 to 1990. The 2000 Census had one question for both seeing and hearing and it was in the Census long form: "Does this person have any of the following long-lasting conditions: a. Blindness, deafness, or a severe vision or hearing impairment? Yes or No." The 2010 Census will not have a long and therefore there are no questions about seeing or hearing in the 2010 Census. Information that would have been on the long form will be obtained from the American Community Survey (ACS). The current ACS (from 2008 onward) has two questions asking about seeing and hearing: Is this person deaf or does he/she have serious difficulty hearing? Yes or No; Is this person blind or does he/she have serious difficulty seeing even when wearing glasses? Yes or No."

2.2 Current seeing questions, concepts, and estimates from the MEPS, NHIS and MCBS

Current seeing activity limitation questions for the MEPS, NHIS and MCBS are provided in Table 1. As indicated by Table 1, MEPS, NHIS, and MCBS all ask about seeing activity limitations while the person is wearing glasses or contacts if they wear them. The actual seeing activity limitations that people are asked about differ among the three surveys. MEPS asks about any difficulty and level of difficulty seeing quantified by the activities of being able to read newsprint, recognizing people two to three feet away, or being blind. The NHIS asks about any trouble seeing and whether the person is blind or unable to see at all. More similar to the NHIS questions, the MCBS questions ask the respondent to quantify their trouble of seeing in terms of no trouble, a little trouble, a lot of trouble, or no usable vision.

Table 1: Seeing activity limitations — Questions	
MEPS	<ul style="list-style-type: none"> - Does anyone in the family wear eyeglasses or contact lenses? Who is that? - Does anyone in the family have any difficulty seeing {with glasses or contacts, if they use them}? Who is that? - For persons identified as having difficulty seeing: <ul style="list-style-type: none"> • Can (PERSON) not see anything at all, that is, (are/is)(PERSON) blind? • {With glasses or contacts, can/Can}(PERSON) see well enough to read ordinary newspaper print, even if (PERSON) cannot read? • {With glasses or contacts, can/Can}(PERSON) see well enough to recognize familiar people if they are two or three feet away?
NHIS	Sample Adult (ages 18 and over) and Sample Child (SC) (ages 2-17): <ul style="list-style-type: none"> - Do (you/SC) have any trouble seeing, even when wearing glasses or contact lenses? - For persons with trouble seeing continue with: <ul style="list-style-type: none"> • Are (you/SC) blind or unable to see at all?
MCBS	Main Questions <ul style="list-style-type: none"> - (Do you/Does SP) wear eyeglasses or contact lenses? Yes or No - Which statement best describes (your/SP's) vision (while wearing glasses or contact lenses) – no trouble seeing, a little trouble, a lot of trouble, or no usable vision?

Table 2: Seeing activity limitations — Concepts and Estimates (Ages 65 and Over)			
<i>Survey</i>	<i>Concept</i>	<i>Estimate (%)</i>	<i>Standard Error</i>
MEPS (2003)	Any difficulty seeing (with glasses, contacts)	12.4	(0.69)
	Cannot read newsprint (with glasses, contacts)	3.9	(0.39)
	Cannot read newsprint and cannot recognize people (with glasses, contacts)	1.2	(0.19)
	Blind (with glasses, contacts)	0.7	(0.15)
NHIS (2003)	Any trouble seeing (with glasses, contacts)	16.6	(0.61)
	Blind or unable to see at all	1.1	(0.15)
MCBS	A little trouble, a lot of trouble, or no usual vision (with glasses or contacts)	32.7	(0.71)
	A lot of trouble, or no usable vision (with glasses or contacts).	7.8	(0.26)
	No usable vision (with glasses or contacts)	0.8	(0.08)

Estimates for seeing activity limitation, Table 2, are provided for MEPS, NHIS and the MCBS. Estimates are restricted to persons ages 65 and over in order to make the target populations as similar as possible across the three surveys. The target population for both

MEPS and NHIS is the U.S. civilian non-institutionalized population. The MCBS population is restricted to Medicare beneficiaries ages 65 and over and living in the community. In order to compare estimates, estimates were provided for the different surveys for different severity levels to see if the estimates for any of these levels of severity would match.

For MEPS the following five mutually exclusive hierarchical categories for persons (with glasses on contacts, if they use them) were created based on severity: 1. no difficulty; 2. some difficulty but can read newsprint; 3. cannot read newsprint but can recognize people; 4. cannot read newsprint and cannot recognize people (but not blind); and 5. blind. MEPS estimates shown in Table 2 are for the following four groups defined from the categories above: Any difficulty seeing--categories 2-5; Cannot read newsprint--categories 3-5; Cannot read newsprint and cannot recognize people--categories 4-5; and Blind--category 5. Estimates depending on severity level from MEPS range from 12.4% for those with Any difficulty seeing, to 3.9% for those who Cannot read newsprint; to 1.2% for those who Cannot read newsprint and cannot recognize people; and to 0.7% for those who are Blind. The NHIS estimates by severity level range from 16.6% for any trouble seeing to 1.1% for blind or unable to see at all. The MCBS, which asks about level of trouble seeing, has estimates by severity level that range from 32.7% for persons with A little trouble, a lot of trouble, or no usable vision to 7.8% for those with A lot of trouble or no usable vision and to 0.8% for those with No usable vision.

Because of different concepts, the survey estimates by severity level vary quite a bit. The concept most similar for all three surveys is being blind or having no usable vision in which the estimates from the three surveys are all in the same ballpark (.7% based on the MEPS, 1.1% based on NHIS; and 0.8% based on the MCBS).

2.3 Current Hearing questions, concepts, and estimates from the MEPS, NHIS and MCBS

Table 3 provides hearing activity limitation questions from the MEPS, NHIS, and MCBS. One difference among the surveys is that the MEPS and MCBS ask about hearing activity limitations while the person is wearing a hearing aid, while the NHIS asks about hearing activity limitations without a hearing aid. The MEPS asks differently about hearing activity limitations than the NHIS and MCBS. The MEPS asks about any difficulty hearing and level of difficulty quantified by whether or not they can hear any speech at all (whether or not they are deaf), hear most of the things people say, or hear some of the things people say. The NHIS and MCBS asks about trouble hearing. The NHIS categories are: good, a little trouble, a lot of trouble, or deaf. The MCBS categories are: no trouble hearing, a little trouble, a lot of trouble or deaf.

Table 3: Hearing activity limitations —Questions	
MEPS	<ul style="list-style-type: none"> - Does anyone in the family have a hearing aid? Who is that? - Does anyone in the family have any difficulty hearing {with a hearing aid if they use one}? Who is that? - For persons identified as having difficulty hearing {with a hearing aid, if they use one}: <ul style="list-style-type: none"> ▪ Can (PERSON) not hear any speech at all, that is, (are/is)(PERSON) deaf? ▪ {With a hearing aid, can/Can} (PERSON) hear most of the things people say? ▪ {With a hearing aid can/Can} (PERSON) hear some of the things people say?
NHIS	<ul style="list-style-type: none"> Sample Adult (ages 18 and over): Have you ever worn a hearing aid? - Sample Adult (ages 18 and over) and Sample Child (ages 0-17): Which statement

	best describes (your/SC's) hearing without a hearing aid : Good, a little trouble, a lot of trouble, or deaf?
MCBS	Main Questions - (Do you/Does SP) use a hearing aid? Yes or No - Which statement best describes (your/SP's) hearing (with a hearing aid) – no trouble hearing, a little trouble, a lot of trouble, or deaf?

<i>Survey</i>	<i>Concept</i>	<i>Estimate (%)</i>	<i>Standard Error</i>
MEPS (2003)	Any difficulty hearing (with hearing aid)	21.0	(0.75)
	Cannot hear most of the things people say (with a hearing aid)	3.0	(0.32)
	Cannot hear some of the things people say (with a hearing aid)	1.3	(0.21)
	Cannot hear any speech at all, that is deaf (with a hearing aid)	0.7	(0.15)
NHIS (2003)	Little trouble, a lot of trouble, or deaf (without a hearing aid)	37.6	(0.79)
	A lot of trouble, or deaf (without a hearing aid)	10.5	(0.52)
	Deaf (without a hearing aid)	1.0	(0.15)
MCBS	A little trouble, a lot of trouble, or deaf (with a hearing aid)	36.4	(0.71)
	A lot of trouble, or deaf (with a hearing aid)	7.3	(0.28)
	Deaf (with a hearing aid)	0.2	(0.05)

Estimates for hearing activity limitation, Table 4, are provided for MEPS, NHIS and the MCBS. Estimates are restricted to persons ages 65 and over in order to make the target populations as similar as possible across the three surveys. The target population for both MEPS and NHIS is the U.S. civilian non-institutionalized population. The MCBS population is restricted to Medicare beneficiaries ages 65 and over and living in the community. In order to compare estimates, estimates were provided for the different surveys for different severity levels to see if the estimates for any of these levels of severity would match.

For MEPS the following five mutually exclusive hierarchical categories for persons (with a hearing aid if they use one) were created based on severity: 1. no difficulty; 2. some difficulty but can hear most of the things people say; 3. cannot hear most but can hear some of the things people say; 4. cannot hear some of the things people say but not deaf; and 5. cannot hear any speech at all, that is deaf. MEPS estimates shown in Table 4 were created from the categories above in the following way: Any difficulty hearing--categories 2-5; Cannot hear most of the things people say--categories 3-5; Cannot hear some of the things people say--categories 4-5; and Cannot hear any speech at all that is deaf--category 5. The hearing activity limitations estimates by severity level from MEPS (stipulated to be with a hearing aid) range from 21.0% for those who have Any difficulty hearing to 3.0% for those who cannot hear most of the things people say, to 1.3% for those who cannot hear some of the things people say, and to 0.7% for those who cannot any speech at all, that is deaf.

Because the NHIS and MCBS both ask about trouble hearing, their estimates by severity level are more similar even though the NHIS asks about trouble hearing without a hearing aid and the MCBS asks about trouble hearing with a hearing aid. According to the NHIS, an estimated 37.6% of those ages 65 and over have A little trouble, a lot of trouble or are deaf. This compares with an estimate of 36.4% from the MCBS. The hearing category that is most similar for all three surveys is the most severe category of being deaf where

the estimates are: 0.7% from the MEPS; 1.0% from the NHIS; and 0.2% from the MCBS..

3. Discussion

Questions or items about seeing and hearing have a longer history of being in the U.S. Census than do any other type of disability. Items or questions about seeing and hearing were included in every U.S. Census from the 1830 Census, the first census with a consistent format across the United States to the 1870 census. There was a shift in focus with the 1880 census where "Blind" or "Deaf and Dumb" were listed along with other reasons for a person's being unable to attend to their ordinary duties. The 1890 census reverted back to asking about specific defects in sight and hearing and the 1910 census asked separately about being blind (both eyes) or being deaf and dumb. Seeing and hearing questions are not included again in a census until the 2000 census which contained one question on the long form for both seeing and hearing: "Does this person have any of the following long-lasting conditions: a. Blindness, deafness, or a severe vision or hearing impairment? Yes or No." The current American Community Survey, which in 2010 will take the place of the census long form, contains two questions, one for seeing and one for hearing. They are: "Is this person deaf or does he/she have serious difficulty hearing? Yes or No; Is this person blind or does he/she have serious difficulty seeing even when wearing glasses? Yes or No."

Although questions about seeing and hearing activity limitations have been asked since the earliest US censuses of the nineteenth century, there is no consistency in how such questions are asked in the early twenty first century in three national surveys: MEPS; NHIS; and MCBS. The current seeing and hearing questions from these three surveys are very different.

For the seeing activity limitation questions, there is consistency in that all three surveys ask about seeing activity limitation when wearing glasses or contacts. However the surveys ask about different concepts ranging from difficulty seeing quantified by specific activities, to level of or any trouble seeing. The only similar concept across all three surveys is whether blind.

The hearing activity limitation questions for the three surveys do not have consistency in whether or not they are asked about limitations with or without a hearing aid. The MEPS and MCBS ask about hearing activity limitations with a hearing aid; the NHIS asks about hearing activity limitations without a hearing aid. Besides this with or without a hearing aid difference, there are differences in hearing activity limitations concepts that are being asked about. The MEPS asks about any difficulty and level of difficulty quantified by being able to hear any, most, or some speech. The NHIS and MCBS ask about level of trouble hearing ranging from good, a little, a lot, or deaf.

4. Conclusions

In conclusion, all three national surveys--MEPS, NHIS and MCBS-- include questions about seeing and hearing limitations. Despite the fact that questions/items about seeing and hearing have been included in the earliest US censuses, there is no consistency in the early twenty-first century in how these questions are asked. The widely different estimates for seeing activity limitations (other than whether blind) suggests the usefulness

of having common concepts and questions about seeing activity limitations. Similarly widely different estimates for hearing activity limitations (other than being deaf) suggests the usefulness of having common concepts and questions about hearing activity limitations. There also needs to be further discussion of whether the hearing questions should be restricted to asking about hearing limitations with or without a hearing aid. Having the same concept and common questions for seeing and hearing activity limitations would increase the ability to benchmark and compare estimates across surveys.

One model for consideration would be the questions about seeing and hearing in the current ACS since 2008. The ACS questions ask about being blind or having serious difficulty seeing, and about being deaf or having serious difficulty hearing. Besides being in the ACS, these questions will produce estimates for 2010 the year of the census since the ACS estimates are being used in place of estimates from the Census long form. They are also currently in or will be in the NHIS, the Current Population Survey (CPS), the National Survey of Family Growth (NSFG), the Survey of Income Program Participation (SIPP), and the National Crime Victimization Survey (NCVS.) Although this may be an important first step in having consistent concepts and questions about seeing and hearing activity limitations in national surveys, more work may be needed in the evaluation of the current ACS seeing and hearing questions. If surveys were restricted to having only two questions, are these the best concepts that should be measured and are these the best questions to measure them? More work may also be needed for the development of additional key concepts and questions for those surveys that have a need and have more space to collect more information about seeing and hearing activity limitations. Sensory experts and survey researchers working together may be able to best inform the evaluation of the current ACS seeing and hearing activity limitation questions, and the development of additional seeing and hearing key concepts and best questions.