

Number of Persons who are Deaf or Hard of Hearing: Rochester, NY

Summary

Rochester, NY has often been cited in the media as having the largest per-capita population of persons who are Deaf or Hard of Hearing (D/HH) in the nation. Using data provided by the American Community Survey's 2008 – 2010 three year public use population estimates, this paper examines whether there is any basis for this claim. Thus, of the approximately 1,155,000 population of the Rochester metro area, about 43,000 or 3.7 percent are persons who are D/HH, and is higher than the national proportion of 3.5 percent. Analyses have revealed that broad statements about the largest per-capita population need to be qualified because other demographic variables such as age are correlated with hearing loss. For example, it was found that, overall, Pittsburgh, PA. has a higher proportion (about 3.9%) of its population who are D/HH than Rochester, but that this difference is accounted for by the fact that Pittsburgh has a much higher proportion of its population who are over the age of 64 than Rochester. However, when the analysis is limited to individuals under the age of 65, Rochester has the highest proportion (1.7%) of persons who are D/HH among the metro areas selected for this analysis. This difference is largely due to the presence of the National Technical Institute for the Deaf on the campus of Rochester Institute of Technology. In Rochester, 0.3 percent of the population between 18 and 25 are persons who are D/HH while the comparable figure is only about 0.1 percent for the nation and six selected metro areas. In addition, 61 percent of Rochesterians between 18 and 25 who are D/HH were attending postsecondary education, compared to only 32 percent for the nation as a whole. Thus, while it cannot be stated categorically, that Rochester has the largest number of D/HH per capita in the U.S., it can be said, with some certainty, that Rochester has the largest per capita population of working age (18 to 64) D/HH persons in the country, and most certainly the largest per capita college age D/HH population in the country (18 to 25).

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In the Rochester area we often read or hear comments such as the following:

“Rochester has one of the largest deaf populations per capita, meaning that out of the total population of Rochester, a substantial percentage are deaf.”

<http://deafness.about.com/cs/culturefeatures3/a/rochester.htm>

“... Rochester is home to the largest deaf population per capita, with about 90,000 people who are deaf or hard of hearing living among the metropolitan area's 700,000 residents.”

<http://www.nytimes.com/2006/12/25/nyregion/25deaf.html?pagewanted=all>

“Although it is not known exactly how many deaf residents live in the region, it is believed that 10,000 to 15,000 people here use sign language to communicate. Researchers and community members hope to get a better population estimate through the surveillance process.”

<http://www.urmc.rochester.edu/news/story/index.cfm?id=2067>

“Rochester is home to about 55,000 Deaf and Hard of Hearing people. It is the largest deaf population, per capita, across the country. Many have graduated from college with post baccalaureate degrees. We are unique!”

<http://www.slc-inc.com/index.html>

The truth of the matter is more akin to this comment by Tom Willard, editor of *deafweekly*:

“If I had a dollar for every time I've seen the claim that Rochester, N.Y. has the nation's largest deaf community per capita, I would have a fistful of dollars. If I had a penny for every time this claim has been backed up with any real proof, I would be penniless.”

<http://tomwillard.wordpress.com/2007/01/08/90000-deafhoh-in-rochester-yeah-right/>

The suggestion that Rochester has a high proportion of persons who are D/HH stems from the establishment of NTID/RIT in 1968 and its influence on the demographics of the deaf population in the Rochester area. Some of the assumptions about how NTID has impacted the local population, whether verified or not, include the following:

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- (1) Some deaf people who originally moved to the Rochester area as NTID/RIT students have subsequently taken up permanent residence in the area (with no continuing affiliation with NTID/RIT other than as alumni). Some have spouses and children who are also deaf.
- (2) Some deaf people have moved to Rochester to join the NTID/RIT faculty and staff. Some have moved here for the first time, and others have returned as alumni. Some have spouses and children who are also deaf.
- (3) By definition, the deaf students who are currently enrolled at NTID/RIT and whose prior education was outside the Rochester area, are temporary residents of the area.
- (4) Some deaf people have moved to the Rochester area to become employees within several elementary/secondary educational programs for deaf students within the area, including the Rochester School for the Deaf. Again, some have spouses and children who are also deaf.

It is the intent of this paper to document the population of persons who are D/HH in Rochester, NY and examine the assumptions described above.

One of reason for the confusion about numbers of individuals who are D/HH is in the definition of who is included under the term deaf. Severity of hearing loss is an important consideration when defining who to include in the population of persons who are D/HH. When describing the severity of hearing impairment, it is important to distinguish whether one or both ears are affected, and the degree of loss in each. A commonly used classification of hearing uses decibel¹ (dB) and classifies loss as mild (21-40 dB), moderate (41-60 dB), moderate-severe (61-70dB), severe (71-90dB) and profound (91+ dB), with each category representing decreasing auditory sensitivity. The category into which an individual is grouped depends on his or her pure tone average (PTA), or the average threshold levels (in decibels) measured at 500, 1000, and 2000 hertz² (Hz). Generally individuals in the severe and profound ranges have been considered D/HH. Unfortunately, this audiological definition obscures differences that may exist *vis-à-vis* communication abilities, educational attainments, social relationships, and cultural identity. As a result, the term “persons who are deaf or hard of hearing” is generally used today to describe the population of individuals with some kind of hearing impairment. This terminology (D/HH) will be used throughout this paper.

Another issue adding to the disagreement about the numbers of persons who are D/HH in the Rochester area has been a lack of census data about the D/HH population of the U.S. that permits

¹ A unit for expressing the relative intensity of sounds on a scale from zero for the average least perceptible sound to about 130 for the average pain level.

² A unit of frequency equal to one cycle per second.

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regional analysis. Since it is not generally feasible to perform in-depth audiological evaluations in connection with large-scale national surveys such as those conducted by the U.S. Bureau of the Census, most studies rely on self-reported responses to survey questions which assess the presence of a disability such as hearing loss. Beginning in 2008, the Bureau of the Census altered its sensory disability question for the American Community Survey (ACS)³ (U.S. Bureau of the Census, 2010a) by dividing a generalized sensory disability question into separate vision and hearing questions. Since 2008 the ACS has classified individuals who responded positively to the question, *Is this person deaf or does he/she have serious difficulty hearing?* as persons who are D/HH.

While the above question does not provide an audiological classification but leaves the definition of “deaf” or “serious difficulty hearing” up to the opinion of the respondent, the results do provide data about the population of individuals who perceive themselves as having serious difficulty hearing, or, as is the case for children, are perceived by their guardians as having a serious hearing problem. Despite this issue of self reporting, data are now available from the U.S. Census Bureau through the ACS about local, regional, and national demographic, occupational, and economic characteristics of the population of persons who are D/HH in the U.S. This paper uses data collected by the U.S. Bureau of the Census to operationally define the population of persons who are D/HH in the Rochester, NY area and compares these results with national data and data from selected metro areas of similar population sizes.

The results reported in this paper were derived using the U.S. Bureau of the Census DataFerrett (U.S. Bureau of the Census, 2010b) to analyze results from the 2008-2010 ACS public use micro data sample estimates. DataFerrett (FERRETT stands for Federated Electronic Research, Review, Extraction, and Tabulation Tool) is a unique cloud based data analysis and extraction tool, with recoding capabilities, that can be used to customize publically available federal, state, and local data to suit individual requirements. Using DataFerrett, one can develop an unlimited array of customized spreadsheets to meet individual needs. The DataFerrett application helps the user locate and retrieve data regardless of where the data resides. An analyst can develop and customize tables and select the results to create a graph or map for a visual depiction of the results.

The U.S. Population

To set the stage for the discussion of the number of persons who are D/HH in Rochester, NY we begin by describing the D/HH population of the U.S. As shown in Table 1, about 3.5 percent (almost 11 million individuals) in the U.S. population have significant difficulty hearing with a much smaller percentage of the younger population having a hearing problem when compared with individuals over 64.

³ The American Community Survey is an annual survey of demographic information, conducted by the U.S. Bureau of the Census, that provides communities with data estimates about how they are changing demographically.

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The majority (58%) of all individuals who are D/HH are 65 years of age or older while only about 4 percent are of school age.⁴

Table 1

Numbers of Persons reported having difficulty hearing in the U.S. population

Age Group	US Population	Number Deaf/HH	% Deaf/HH
0-17	74,143,370	453,171	0.6%
18-25	34,858,027	271,588	0.8%
26-64	158,141,107	3,855,473	2.4%
65+	39,595,930	6,278,680	15.9%
Total	306,738,434	10,858,912	3.5%

Source: 2008-2010 American Community Survey three year estimates, public use data sample.

So, while we might expect Rochester to exceed the national 3.5 percent of its population who are D/HH, it is likely that places such as Sun City, Arizona, Naples, Florida, or some other and the resulting high incidence of late onset of deafness. The overall results reported for any region of the country must take into account this age-related factor. We will see shortly that differences in age distributions do affect results and must temper the broad assertions about the relative size of the population of persons who are D/HH in Rochester, NY.

The D/HH Population of the Rochester Area

Given the caution concerning age, if we limit the question to individuals under the age of 65, before the onset of an age related hearing loss, it is likely that Rochester, NY, does, according to ACS data, have a relatively larger concentration of D/HH people when compared to other metro areas in the U.S.; the reason being the presence of the National Technical Institute for the Deaf at the Rochester Institute of Technology (NTID/RIT). Bear in mind, that the results presented in this paper are dependent on the way we have chosen to define D/HH: vis-à-vis the question about hearing loss as asked on the American Community Survey.

⁴ These estimates are very similar to the approximately 11,000,000 people in the United States over 5 years of age who are D/HH reported by Mitchell (2006) who used the 2002 Survey of Income and Program Participation (SIPP) to make his estimates. It is probably safe to say that the numbers reported from the ACS and the SIPP include, for the most part, individuals from the same population of D/HH persons.

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As shown in the footnote to Table 2, we will define the Rochester area as Monroe County (within which the city itself is located), and all or parts of five adjacent counties as defined by the U.S. Census Bureau's Public Use Microdata Areas (PUMA's)(U.S. Bureau of the Census, 2010). Using the ACS 2008-2010 estimates, the population of this area totaled 1,154,703 of whom, 42,674 indicated they were "deaf or have severe difficulty hearing" (Table 2). This figure represents about 3.7 percent of the population of the Rochester metro area. This percentage is significantly different ($z=9.027$, $p < .0002$) from the 3.5 percent reported for the nation as a whole and is higher than all the other selected metro areas represented in Table 2, except Pittsburgh, PA. where 3.9 percent of the population was estimated to be D/HH – significantly higher ($z=6.276$, $p < .0002$) than Rochester's 3.7 percent. As described earlier in this paper, it turns out that Pittsburgh has a high percentage of individuals 65 and over. Upon closer inspection, it can be observed that 64 percent of individuals who are D/HH in Pittsburgh are 65 or older while only 54 percent of persons from Rochester who are D/HH are 65 or older. If the estimates are correct, Pittsburgh has a significantly ($z=27.93$, $p < .0002$) higher proportion of its D/HH population who are over the age of 64 than is the case for Rochester.

For individuals under the age of 65, about 41 percent of the Rochester D/HH population is between 18 and 64 compared to only 34 percent for Pittsburgh. For ages 18-64 Rochester not only has a significantly higher ($z=13.737$, $p < .0002$) percentage than the nation, but higher than an of the metropolitan areas chosen for comparison. These comparisons seem to verify the assumptions stated above about the influences on the Rochester D/HH population; especially those related to increases in college age and working age persons who are D/HH.

The effect of NTID/RIT is also reflected in the relatively high (when compared to the nation and the selected metro areas) 0.3 percent of the D/HH population who are 18 to 25 year olds. Further support for this assumption is presented in Table 3 which lists the numbers and percentages of 18 to 25 year olds enrolled in postsecondary education. It can be observed that Rochester not only has the highest number, by far, of 18 to 25 year olds than any of the selected metro areas, but the percentage attending

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Table 2

D/HH population of the U.S. and selected metropolitan areas in the U.S.

	Population	Age									
		0-17		18-25		26-64		65+		Total	
		# D/HH	% D/HH	# D/HH	% D/HH	# D/HH	% D/HH	# D/HH	% D/HH	# D/HH	% D/HH
U.S.	306,738,434	453,171	0.1%	271,588	0.1%	3,855,473	1.3%	6,278,680	2.0%	10,858,912	3.5%
Rochester, NY⁵	1,154,703	1,839	0.2%	2,963	0.3%	14,636	1.3%	23,236	2.0%	42,674	3.7%
Austin, TX⁶	1,748,063	2,556	0.1%	1,977	0.1%	21,013	1.2%	23,217	1.3%	48,763	2.8%
Charlotte, NC⁷	1,701,239	2,500	0.1%	1,774	0.1%	17,974	1.1%	26,881	1.6%	49,129	2.9%
Columbus, OH⁸	1,154,124	1,740	0.2%	999	0.1%	12,716	1.1%	16,187	1.4%	31,642	2.7%
Minneapolis, MN⁹	1,651,893	1,770	0.1%	1,723	0.1%	14,896	0.9%	27,576	1.7%	45,965	2.8%
Pittsburgh, PA¹⁰	1,222,475	1,192	0.1%	1,580	0.1%	14,365	1.2%	29,970	2.5%	47,107	3.9%
Seattle, WA¹¹	1,383,855	1,235	0.1%	693	0.1%	13,521	1.0%	23,683	1.7%	39,132	2.8%

Source: U.S. Census Bureau, American Community Survey (2010)

⁵ 2008-2010 ACS NY PUMAs: 00901, 00902, 01001, 01002, 01003, 01004, 01005, 01100, 01200, 01300.

⁶ 2008-2010 ACS TX PUMAs: 05100, 05201, 05202, 05301, 05302, 05303, 05304, 05401, 05402.

⁷ 2008-2010 ACS NC PUMAs: 00901, 00902, 00903, 00904, 00905, 01000, 01100, 01200, 001300, 01400.

⁸ 2008-2010 ACS OH PUMAs: 03101, 03102, 03103, 03104, 03105, 03106, 03107, 03108, 03109.

⁹ 2008-2010 ACS MN PUMAs: 01301, 01302, 01303, 01401, 01402, 01403, 01404, 01405, 01406, 01501, 10502, 01601, 01602.

¹⁰ 2008-2010 ACS PA PUMAs: 01701, 01702, 01703, 01801, 01802, 01803, 01804, 01805, 01806, 01807.

¹¹ 2008-2010 ACS WA PUMAs: 01801, 01802, 01803, 01804, 01805, 01900, 02201, 02202, 02203, 02204, 02205.

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postsecondary education (61.4%) is almost double the national average and 50 percent higher than Columbus, OH., its nearest competitor. This finding is certainly due to the presence of NTID/RIT. It is also encouraging that the population estimates made by the ACS account for the more than 1,200 D/HH students who were attending NTID/RIT from 2008 to 2010. Without the presence of NTID/RIT these individuals would not normally be part of population estimates of the Rochester region.

Table 3

Number and percentage of D/HH individuals attending postsecondary education.

	# 18 - 25	# Postsecondary	% Postsecondary
U.S.	271,588	71,852	32.5%
Rochester, NY	2,963	1,766	61.4%
Austin, TX	1,997	284	25.8%
Charlotte, NC	1,774	372	29.5%
Columbus, OH	999	443	44.4%
Minneapolis, MN	1,723	713	42.3%
Pittsburgh, PA	1,580	648	42.6%
Seattle, WA	693	86	12.3%

Source: U.S. Census Bureau, American Community Survey (2008-2010 three year estimates).

Closing Comments

This paper has used the American Community Survey's 2008-2010 aggregated data to estimate the D/HH population of the greater Rochester, NY area and compare these figures with national estimates and six other metropolitan areas throughout the U.S. For the population as a whole, Rochester has a significantly higher proportion of individuals who are D/HH than the nation as a whole. We cannot say for certain if it is the largest in the U.S. since of the six selected areas, Pittsburgh, PA. has, across all age groups, a higher proportion of individuals who are D/HH. It is highly likely that there are other such metro areas in the country. These higher

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percentages will often be due to the fact that, like Pittsburgh, they have a relatively high population of individuals who are over 65. If, however, we consider the population of individuals who are D/HH between 18 and 64, Rochester has the highest proportion among the metro areas considered in this study. We have also shown that this is due to the presence of the National Technical Institute for the Deaf, one of the colleges of Rochester Institute of Technology.

Thus, while we cannot say, categorically, that Rochester has the largest number of D/HH per capita in the U.S., we can say, with some certainty, that Rochester has the largest per capita population of working age (18 to 64) D/HH persons in the country, and most certainly the largest per capita college age D/HH population in the country.

Deaf seniors. A case in point is the need for better demographic information on the more than 23,000 elderly deaf people estimated to be residents of the Rochester area. Elderly people comprise more than 50 percent of the total D/HH population but receive much less public attention as people who are D/HH than they do as people who are elderly. A regional study of this population would furnish much more reliable and in-depth demographic information than the present paper offers. While there will continue to be a reliance on public institutions such as the Census Bureau for baseline information, a collaborative effort on the part of interested local organizations, with leadership from people who are D/HH, could gather complementary demographic information of value to a variety of organizations of, and serving seniors who are D/HH.

Consistency in reporting. This paper has been prepared to encourage more consistency in reporting on the demographics of deaf people in the Rochester area. The use of the American Community Survey provides a tool to monitor changes in the D/HH population of Rochester, NY. Of course the reader has the right to disagree with the use of the ACS and the numbers presented here. However, if a researcher uses a different source, it is suggested that the source of those numbers be cited and also the criteria used for selecting the individuals who are D/HH. Data from the ACS are based on a sample and thus are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. This is especially the case when one considers estimates made from a sample of an already low incidence group such as individuals who are D/HH, especially those who are under the age of 65.

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