wireless RERC Rehabilitation Engineering Research Center

RESEARCH BRIEF

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Technology Use by People with Hearing and Speech Loss for Communicating with Emergency Response Services

Introduction

This research brief presents survey data collected by the Wireless RERC on actual and preferred methods for contacting emergency response services by people living with hearing and/or speech loss. The data were collected as part of the Survey on Emergency Communications and People with Disabilities conducted by the Rehabilitation Engineering Research Center for Wireless Technologies (Wireless RERC).

These questions are of critical importance as access to emergency services by people with physical, sensory and cognitive disabilities can mean the difference between life and death. Additionally, ongoing innovation in consumer technologies – especially mobile wireless technologies – has made possible new ways of contacting and communicating with emergency response services. Against this backdrop federal regulatory authorities have been engaged in rulemaking to ensure equitable access to emergency response services by people with disabilities, especially people who have difficulty communicating by voice – people living with hearing or speech loss.

Methodology

Data were collected from November 1, 2012 through March 30, 2013 using convenience sampling to draw a sample of adults over age 18 with any type of disability. Participants were recruited through the Wireless RERC's Consumer Advisory Network (CAN), a nationwide network of consumers with disabilities. In addition, the research team conducted recruiting outreach via its internet and social media outlets, including the Wireless RERC website, and Twitter,Facebook and LinkedIn accounts.

Recruiting was also carried out by asking individuals working on disability issues at the national, state and local levels to disseminate the invitation to participate to their networks of people with disabilities. These organizations included the Department of Labor's Office of Disability Employment Policy , U.S. Department of Transportation, Federal Emergency Management Agency's Office of Disability Integration and Coordination (FEMA-ODIC), Federal Communications Commission's Consumer and Governmental Affairs Bureau, National Emergency Numbering Association (NENA), National Organization on Disability, National Association of the Deaf, American Stroke Association, Hearing Loss Association of America (HLAA), American Foundation for the Blind, National Federation of the Blind, the

Coalition of Organizations for Accessible Technology, Alternative Media Access Center, California State University, Technical College System of Georgia, Pennsylvania State University and others.

Demographics

In all, 1772 people responded to the survey, 1179 of whom indicated that they had at least one of a list of eight general disability types based on the American Community Survey (ACS) and supplemented by categories from the semi-annual National Health Interview Survey (NHIS) conducted by the Centers for Disease Control and Prevention (CDC). These disability categories and the percentage of respondents in each are listed below.

TABLE 1 - Disability Type	Percentage of respondents	Number of respondents
Seeing (blind or low vision, even when wearing glasses)	21%	244
- Blind	7%	79
- Low vision	14%	165
Hearing (deaf or hard of hearing, even when wearing aids)	42%	499
- Deaf	19%	222
- Hard of Hearing	24%	277
Frequent worry, nervousness or anxiety	25%	296
Concentrating, remembering, or making decisions	22%	261
Speaking so people can understand you	16%	187
Using your arms	13%	155
Using your hands and fingers	18%	208
Walking, standing, or climbing stairs	44%	521

The sample has an age range of 19-98, with an average age of 52. The majority of respondents (63%) were women, and white/caucasian (86%). In terms of education, 29% had some college education with no degree or less. Another 11% had earned an associate's degree, while the rest had either a bachelor's degree or higher. The somewhat high level of education of the sample, however, did not translate into unusually high levels of income – almost half of the sample (48%) reported annual household incomes below $35,000.

TABLE 2 - Age and gender	Percentage of respondents
AGE	
Age range	19-98
Age average	52
Median age	53

Standard deviation – age	13
GENDER	
Men	37%
Women	63%

Actual and preferred technology for contacting emergency response services

Respondents were asked a series of questions about the technology they have used to contact emergency response services and their preferred technology for doing so.

TABLE 3 – If you have ever made an emergency (911) call, HOW did you do so? (Check all that apply)

	Deaf	Hard of hearing	Difficulty speaking
Voice call over landline phone	8%	38%	38%
Voice call over cell phone	3%	33%	29%
TTY over landline	22%	7%	10%
TTY over cell phone	2%	0%	1%
Text message over cell phone	6%	1%	2%
Other text-based message (for example: email or instant messaging)	4%	1%	2%
Telephone relay service over landline	6%	1%	4%
Telephone relay service over cell phone	2%	< 1%	< 1%
Video relay service	30%	9%	11%
Nonrelay video call	1%	0%	2%
Telephone enabled augmentative and alternative communication (AAC) device	1%	< 1%	2%

TABLE 4 – If you could choose HOW to make a call to emergency services, which ways do you prefer? (Check all that apply)

	Deaf	Hard of hearing	Difficulty speaking
Voice call over landline phone	5%	41%	39%
Voice call over cell phone	5%	46%	47%
TTY over landline	11%	4%	7%
TTY over cell phone	5%	3%	5%
Text message over cell phone	64%	44%	39%
Other text-based message (for example: email or instant messaging)	37%	28%	28%
Telephone relay service over landline	10%	12%	10%
Telephone relay service over cell phone	9%	13%	10%
Video relay service	72%	24%	31%

Nonrelay video call	7%	2%	5%
Telephone enabled augmentative and alternative communication (AAC) device	1%	3%	10%

For deaf respondents who have contacted emergency services, the most common technologies used were video relay service (30%) and TTY over landline (22%). For this group, video relay service and text messaging over cellphone were by far the most commonly preferred technologies (72% and 64%, respectively).

For respondents who are hard of hearing and/or have difficulty speaking, the most common method they used for contacting emergency response services was voice calling, whether over landline or cellphone. For these respondents voice calling is among the most preferred technologies for communicating with emergency services.

Notably, text messaging over cellphone was approximately equally preferred (44% and 39%, respectively) to voice calling for people who are hard of hearing or have difficulty speaking. Other text-based messaging (such as email and instant messaging) and video relay service were also popular preferences for these two groups of respondents.

Analysis

The survey data clearly demonstrate that there is a strong interest among people with hearing and speech loss in video relay services and text-based systems for communicating with emergency response services. For all three groups of respondents – deaf, hard of hearing, and those with difficulty speaking – preferences for video relay and text-based messaging is much greater than their current or recent use.

For use of TTY to communicate with emergency services, the situation is reversed, though not so starkly. Use of TTY over landline in these situations is consistently greater than *preferences* for use of this technology. This difference is greatest between the percentage of deaf respondents who have used TTY over landline (22%) and the percentage that prefer to communicate via this technology (11%). However, these percentages still represent a substantial portion of the population, especially the percentage of deaf respondents who have used TTY to communicate with emergency services. Consequently, engineers and policy makers need to be cautious when considering the set of technologies that will be supported for citizens contacting emergency services.

With regard to TTY over cellphones, levels of reported use for contacting emergency services is low: 2% of deaf respondents, 0% of hard of hearing respondents, and 1% of respondents with difficulty speaking *have used* mobile TTY to contact emergency services. Preferences for using mobile TTY to contact emergency services are higher: 5% of deaf respondents, 3% of hard of hearing respondents, and 5% of respondents with difficulty speaking *prefer* mobile TYY. Consequently, the implementation of text-to-

911 may not supplant the need for mobile TTY until a comparable substitute becomes available that offers the real-time, character-by-character transmission currently offered by TTY.

About the Wireless RERC

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