Wireless Technology Use and Disability: Results from the Survey of User Needs

John Morris, Ph.D.
Research Scientist, Wireless RERC
john_morris@shepherd.org

CTIA Wireless 2013
Accessibility Outreach Initiative

wireless RERC Rehabilitation Engineering Research Center

The Rehabilitation Engineering Research Center for Wireless Technologies is sponsored by the National Institute on Disability and Rehabilitation Research (NIDRR) of the U.S. Department of Education under grant number H133E110002. The opinions contained in this website are those of the Wireless RERC and do not necessarily reflect those of the U.S. Department of Education or NIDRR.

The Rehabilitation Engineering Research Center for Wireless Technologies is funded by a 5-year grant from the U.S. Department of Education's National Institute on Disability and Rehabilitation Research.

Overview of the Survey of User Needs

Structure of current SUN	
Part 1	About you – Demographics (age, race, gender, etc)
Part 2	About your abilities
Part 3	About your wireless devices
Part 4	About your wireless activities
Part 5	About your wireless service plans

wireless RERC Rehabilitation Engineering Research Center

2

The Survey of User Needs is comprehensive. It includes 5 parts covering demographics, disability, wireless device ownership and use, wireless activities, and wireless service plans.

Survey of User Needs - Sample

Data collection period: 10/01/2012 – 05/15/2013

Number of respondents/ with disabilities: 780 / 659

Gender:

- Female 57%
- Male 43%

Age:

- Range 18-89
- Mean 50
- Median 52
- Std Deviation 15.16

wireless RERC Rehabilitation Engineering Research Center

3

Convenience sampling is used, because of the difficulties of traditional random digit dialing for populations that may access communications technology in different ways.

We partially correct for biases by weighting the response data by the income distribution in the American Community Survey (ACS).

Gender distribution roughly matches the general population of the U.S. However, at 57% of respondents, females are slightly overrepresented.

Mean and median age are high. This is partly a result of not including minors under age 18 in the sample, which shifts the mean and median higher.

Survey of User Needs - Sample

DO YOU HAVE ANY OF THE FOLLOWING DIFFICULTIES?	
Difficulty walking or climbing stairs	39%
Difficulty hearing	36%
Difficulty seeing	29%
Difficulty using hands or fingers	26%
Difficulty concentrating, remembering, deciding	24%
Frequent worry, nervousness, or anxiety	20%
Difficulty using arms	17%
Difficulty speaking so people can understand me	14%

wireless RERC Rehabilitation Engineering Research Center

4

8 disability types are included. These are based primarily on the 6 core categories of the American Community Survey, and augmented by categories in the National Health Interview Survey conducted by the CDC.

Categories include: walking (or mobility), hearing, seeing, using hands and fingers, cognitive limitations, anxiety/emotional challenges, using arms, and speaking.

Respondents could select all that apply. Many selected more than 1 difficulty.

Survey of User Needs - Sample

Visual impairment and hearing loss*	
Blind	11%
Low vision	15%
Deaf	10%
Hard of hearing	26%

*Percent of total respondents with disabilities.

wireless RERC Rehabilitation Engineering Research Center

5

The seeing and hearing respondents were asked to specify whether they were blind or had low vision, or were deaf or hard of hearing.

Data analysis – Respondents with disability

1. Use of wireless technology – adoption rates
2. Preferences for operating systems
3. Wireless substitution - "cutting the cord"
4. Economic divide
5. Urban-rural divide
6. Age divide
7. Disability type and device type

wireless RERC Rehabilitation Engineering Research Center

6

Several key questions are addressed in this presentation. Of course, first and foremost is the question of adoption rates, followed by operating systems, wireless substitution.

Wireless Use – All Respondents with Disability

Wireless Use and Type of Device	SUN	Pew
Do you own or use a wireless device such as a cell phone or tablet? (Yes)	91%	87%*
If you own or use a cell phone or tablet, what kind do you use? (Check all that apply)		
Basic phone (e.g., Motorola Razr, Pantech Breeze, Nokia 6350)	33%	42%
Smartphone (e.g., iPhone, Android phone, BlackBerry, Windows phone)	59%	45%
Tablet (e.g., iPad, Kindle Fire, Galaxy Tab, Google Nexus)	33%	31%
Other (iPod Touch, Nook, Kindle, netbook, laptop)	6%	--

***Cell phone only; http://pewinternet.org/Commentary/2012/February/Pew-Internet-Mobile.aspx**

wireless RERC Rehabilitation Engineering Research Center

7

This table compares wireless ownership rates of respondents with disabilities to the general population as measured by the Pew Center on the Internet and American Life project.

Both groups show high adoption rates: 91% for SUN respondents with disabilities. 87% for the general population sampled by Pew. Not a significant statistical difference.

SUN respondents with disabilities have higher rates of ownership of smartphones than the Pew's sample of the general population: 59% versus 45%, respectively.

WireLINE Use – Respondents with Disability

Is there at least one telephone INSIDE your home that is currently working and is NOT a cell phone? - BY INCOME (% yes)	
Less than $10,000	59%
$10,000-$14,999	66%
$15,000-$24,999	74%
$25,000-$34,999	68%
$35,000-$49,999	76%
$50,000-$74,999	77%
$75,000 or more	81%
OVERALL AVERAGE	**73%**

wireless RERC Rehabilitation Engineering Research Center

8

The SUN data show that household income is related to the presence of a working landline phone in the household. Generally, households with higher incomes are more likely to have a working landline. The percentage of respondents with disabilities who have a working landline at home is higher than for the general population (73% versus about 65% for the general population).

WireLINE Use – Respondents with Disability

Is there at least one telephone INSIDE your home that is currently working and is NOT a cell phone? - BY AGE (% yes)	
18-30	61%
31-40	52%
41-50	72%
51-60	78%
61-70	85%
Over 70 years old	90%

The SUN data show that age is related to the presence of a working landline phone in the household. Generally, older respondents are more likely to have a working landline. The CDC's National Health Interview Survey shows similar effects: younger people are more likely to cut the cord.

Wireless Use – All Respondents with Disability

If you own or use a cell phone or tablet, what kind do you use? (Check all that apply) - INCOME

	No wireless device	Basic phone	Smartphone	Tablet
Less than $10,000	1%	34%	47%	24%
$10,000-$14,999	4%	42%	44%	21%
$15,000-$24,999	9%	29%	43%	19%
$25,000-$34,999	3%	40%	45%	27%
$35,000-$49,999	3%	40%	52%	27%
$50,000-$74,999	6%	32%	55%	36%
$75,000 or more	0%	19%	74%	46%

wireless RERC Rehabilitation Engineering Research Center

10

This table shows 7 income levels in the first column. Across the top are 4 options for device type: no wireless device, basic phone, smartphone, and tablet.

As would be expected, respondents with higher incomes are more likely to own smartphones and tablets. The data are more mixed for ownership of basic phones. But, there does seem to be an income effect whereby higher income respondents are less likely to own basic phones.

Even among those in the lowest income brackets, non-wireless users are rare.

Wireless Use – All Respondents with Disability

If you own or use a cell phone or tablet, what kind do you use? (Check all that apply) – URBAN-SUBURBAN-RURAL

	No wireless device	Basic phone	Smartphone	Tablet
Urban area	2%	33%	50%	28%
Suburban area	5%	31%	57%	34%
Rural area	2%	31%	55%	27%

wireless RERC Rehabilitation Engineering Research Center

11

Rural access is another common theme related to wireless use for the general population, and for people with disabilities. This is especially a concern for mobile broadband access.

This slide has the same column headings for device type as the previous slide: no device, basic phone, smartphone, and tablet.

The row headers in the first column are for location of the respondent’s home: urban area, suburban area, and rural area.

This slide suggests that rural users with disabilities are connected at similar rates as their suburban and urban counterparts. More analysis is required.

Wireless Use – All Respondents with Disability

If you own or use a cell phone or tablet, what kind do you use? (Check all that apply) - AGE

	No wireless device	Basic phone	Smartphone	Tablet
18-30	4%	26%	57%	37%
31-40	3%	28%	66%	38%
41-50	2%	26%	60%	37%
51-60	3%	33%	54%	24%
61-70	3%	39%	48%	26%
Over 70 years old	16%	50%	23%	32%

wireless RERC Rehabilitation Engineering Research Center

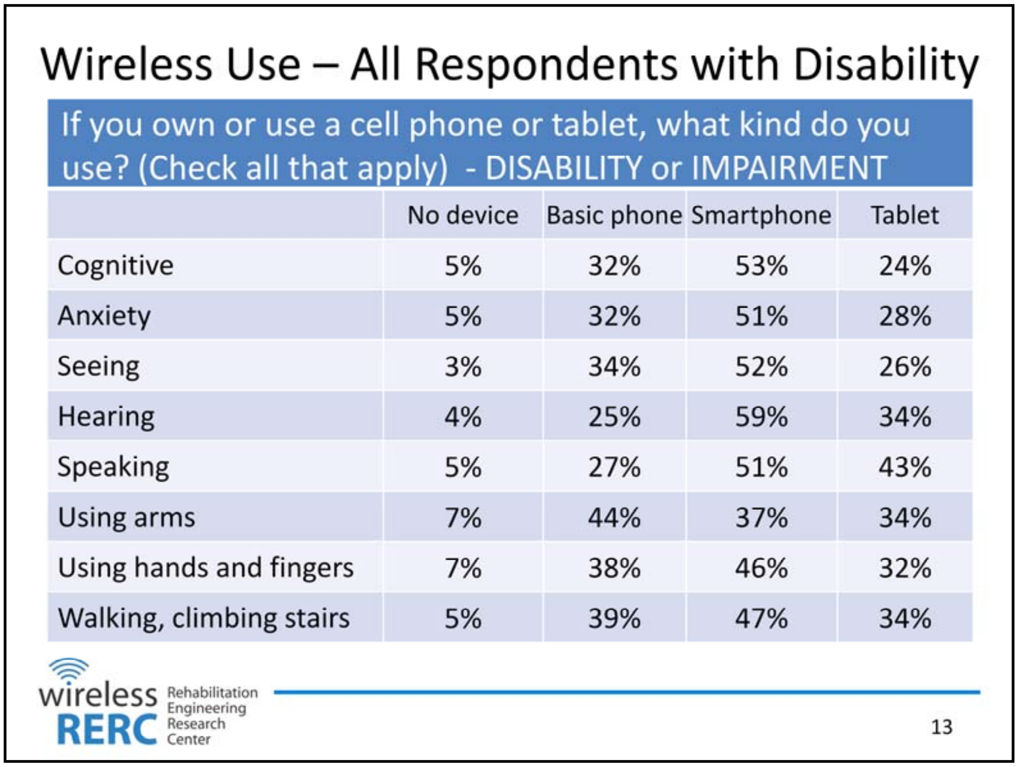
12

Age and device ownership. This slide has the same column headings for device type as the previous slide: no device, basic phone, smartphone, and tablet.

Only over-70 group stands out for no wireless ownership at 16% of respondents.

Also, as expected use of basic phones increases generally with age from 26% of the 18-30 age group, to 39% of the 51-70 age group, and 50% of the over 70 age group.

Use of smartphones generally declines with age, especially among the two oldest age groups. Impact of age on tablet ownership is mixed.



Wireless Use – All Respondents with Disability

If you own or use a cell phone or tablet, what kind do you use? (Check all that apply) - DISABILITY or IMPAIRMENT

	No device	Basic phone	Smartphone	Tablet
Cognitive	5%	32%	53%	24%
Anxiety	5%	32%	51%	28%
Seeing	3%	34%	52%	26%
Hearing	4%	25%	59%	34%
Speaking	5%	27%	51%	43%
Using arms	7%	44%	37%	34%
Using hands and fingers	7%	38%	46%	32%
Walking, climbing stairs	5%	39%	47%	34%

Disability type and wireless use. This slide has the same column headings for device type as the previous slide: no device, basic phone, smartphone, and tablet.

The row headings show the 8 general disabililty categories used before, cognitive, emotional difficulties, seeing, hearing, speaking, using arms, using hands and fingers, and walking.

Non-use of wireless devices is generally consistent across disability groups, ranging from 3% to 7%. People with difficulties in mobility, and use of arms and hands, use basic phones at higher rates than people with sensory or cognitive difficulties or limitations.

People with hearing loss seem distinctly use smartphones more than people with other disabilities. And, people with difficulty speaking use tablets at higher rates.

Wireless Use – All Respondents with Disability

If you own or use a cell phone or tablet, what kind do you use? (Check all that apply) - DISABILITY or IMPAIRMENT				
	No device	Basic phone	Smartphone	Tablet
Hearing Loss				
- Deaf	5%	19%	66%	46%
- Hard of hearing	5%	29%	55%	29%
Vision Loss				
- Blind	1%	32%	52%	14%
- Low vision	7%	37%	48%	33%

wireless RERC Rehabilitation Engineering Research Center

14

In both groups of sensory loss (hearing and vision) the respondents with greater loss (deaf and blind, respectively) use smart phones more than the respondents who are hard or hearing or have low vision. 66 percent of deaf respondents use smarphones, compared to 55% of those who are hard of hearing. 52% of blind respondents use smartphones compared to 48% with low vision, a weaker effect.

Notably, a very low percentage of blind respondents use tablets. This makes sense, since the larger display of a tablet is would be less important to a user who is blind.

Choosing Provider – Respondents with Disability

Why did you choose your wireless service provider? By DISABILITY or IMPAIRMENT					
	Best price for the service	Best service options	Best quality of signal	Best support	Other
Cognitive	29%	13%	17%	6%	34%
Anxiety	34%	16%	20%	5%	25%
Seeing	24%	19%	21%	3%	34%
Hearing	29%	14%	16%	5%	36%
Speaking	28%	20%	14%	3%	35%
Using arms	28%	21%	26%	5%	20%
Using hands and fingers	28%	19%	22%	4%	26%
Walking, climbing stairs	30%	17%	21%	4%	26%

Wireless RERC Rehabilitation Engineering Research Center

Choice of service provider by disability type.

This slide shows a data table with the same 8 disability categories in the row headers as previous slides. The column heading are possible responses to the question: Why did you choose your wireless service provider? Answers are: best price for the service, best service options, best quality of the signal, best support and other.

Among the specific choices, best price for the service was the most frequent response, chosen by 24% to 34% of the 8 disability groups. Notably, best support was not commonly chosen, with only 3%-6% of the 8 groups saying this was why they chose their service provider.

Specialized Service Plans and Disability

Would you be interested in any of the following types of wireless service plans? (Check all that apply)	None of these options	Voice-only	Text-only	Data-only
Blind	76%	10%	3%	11%
Deaf	68%	0%	19%	13%
Difficulty speaking	81%	7%	8%	5%

wireless RERC Rehabilitation Engineering Research Center

16

Specific service plans.

This table shows responses for the question: Would you be interested in any of the following types of wireless service plans? Options in the column headers include: none of these options, voice-only plan, text-only plan, data-only plan.

The row headings include only 3 groups of respondents who are blind, deaf, or who have difficulty speaking. High percentages said they were not interested in one of these specialized plans: 68% of deaf respondents, 76% of blind respondents, and 81% of respondents with difficulty speaking.

Deaf respondents stood out as being most interested in one of the specific plans, with 19% interested in text-only plans, and 13% interested in data-only plans.