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## Internet Access Among Low-Income WIC Populations

Robert Bensley<sup>1</sup>, John Brusk<sup>1</sup>, Judith Anderson<sup>2</sup>, Susan Babi<sup>3</sup>, Sandra Saperstein<sup>4</sup>

<sup>1</sup>Western Michigan University, Department of HPER

<sup>2</sup>Michigan Department of Community Health, WIC Division

<sup>3</sup>Washington WIC Program, Division of Community and Family Health

<sup>4</sup>University of Maryland

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### Abstract

The purpose of this study was to compare Internet access characteristics among low-income populations associated with a supplemental nutrition program. Three sample populations were provided the same data collection items to determine Internet access issues associated with participants in the USDA Women, Infants, and Children (WIC) program in Michigan and Washington. A cross-sectional design was used with data reported using frequency distributions and Chi-square ( $p < .05$ ) analyses. A total of 2,942 WIC clients completed the questionnaire at local agencies in Michigan and Washington. Over 2/3 of participants indicated having some access to the Internet, with 50% to 63% having "easy access." Older participants were more likely to access the Internet from home or work, while younger clients were likely to access from parent's home or WIC clinic. Younger clients were more likely to enjoy learning from the web, as were those who owned a computer. This study provides evidence that the Internet may be a viable means for reaching low-income populations.

### Introduction

The Internet has rapidly become an important tool for disseminating health information. Beyond serving as an information resource, the Internet has the potential to provide users with a means to exchange social support, participate in behavioral change and disease management programs, and to communicate with healthcare providers.<sup>1</sup>

The rate of Internet adoption may be the fastest of any innovation in history, and the rate of broadband adoption has been faster than that for the Internet in general, personal computers, and VCRs.<sup>1,2</sup> In 1998, about one-quarter of Americans had home access to the Internet.<sup>3</sup> By 2003, over half of Americans had home access.<sup>2</sup> Three years later, 73% of American adults reported using the Internet, with 42% reporting a high-speed Internet connection at home.<sup>4-5</sup>

However, Internet adoption has not increased equally throughout the population. People with the greatest health risks often have had the least access to health care, social services, health information, and communication technologies.<sup>3,6</sup> This disparity in access to digital information has been referred to as the "digital divide."<sup>3</sup> The digital divide can widen as those with Internet access obtain and use its resources, while those without lag further behind.<sup>7</sup> The belief that the Internet can be an important resource in overcoming health disparities is reflected in Healthy People 2010, the nation's comprehensive disease prevention and health promotion plan, which includes Objective 11-1: Increase the proportion of households with access to the Internet at home.<sup>3</sup>

Healthy People 2010 documented that many groups lack Internet access, particularly those with lower incomes, lesser education, and those from certain racial and ethnic groups, such as African Americans and Hispanics.<sup>3</sup> Additional studies and reports have confirmed

the existence and persistence of these disparities.<sup>4,8-14</sup>

Many public and private programs have provided Internet access for populations who might not otherwise have had access.<sup>7</sup> While home access has been considered the ideal location for Internet access, community access points can provide alternative locations from which to use the Internet.<sup>1</sup> Those with lower incomes, lesser education, and certain minority groups are more likely than their counterparts to use computers in public libraries or community centers.<sup>6-7</sup> However, having access only in public places may limit the benefits of Internet. For example, Smith-Barbaro and colleagues found that those with Internet access at home were about five times more likely than their counterparts to report intention to use a health information website sponsored by the health center in which they received care than those without home access.<sup>15</sup> They concluded that for sensitive health information, searching in the privacy of one's home might be the optimal location.

Although lack of access can be a barrier to the Internet and its advantages, non-use of the Internet can occur for other reasons. These include a lack of interest in the Internet, the cost of a computer and/or Internet connection, concerns about confidentiality and inappropriate content, a lack of knowledge and skills, and a lack of time.<sup>2,11</sup> Additionally, some people are intimidated by computers or have found searching and navigation difficult.<sup>11,16-17</sup>

Use of the Internet has rapidly increased throughout the population in this country and elsewhere. More and more people are showing interest in its use for health information. However, the groups that typically lack access to the Internet are often those who might have the most to gain from its resources. The purpose of this paper is to provide results from three independent studies focusing on the Internet's potential for providing nutritional education in a low-income population. Specifically, issues of computer ownership, Internet access, and location of Internet access among those receiving assistance from the US Department of Agriculture Food and Nutrition Service's Special Supplemental Nutrition Program for Women, Infants and Children (WIC) were assessed in order to determine the extent of this population's ability to access Internet-based nutrition information.

## **Methods**

Three independent surveys were conducted to ascertain Internet access clients enrolled in WIC in Michigan and Washington. Each survey varied, albeit slightly, in terms of length of data collection. However, this difference was not critical as the purpose of this paper is to provide findings on Internet access, rather than the impact of the intervention. Data collection items related to the purposes of this study were identical in all three surveys and included items relating to age, child's age, relationship to child, location where Internet was accessed, computer ownership, and interest in learning from the Internet. Significance of differences were tested by chi square tests for each cross tabulation. A brief description of each study is provided below.

- **Michigan Internet Access Survey**  
All Michigan WIC agency participants who accessed WIC services during a 1-month period were invited to complete a questionnaire administered by WIC personnel during their clinic visit.
- **Detroit Internet Access Survey**  
The Detroit study was similar to the larger Michigan study in that all Detroit WIC agency participants who accessed WIC services during a 1-week period were invited to complete a questionnaire administered by WIC personnel during their clinic visit.
- **Washington Internet Access Survey**  
Washington WIC agency clients who had not previously visited an Internet-based nutrition education site and who accessed WIC services over a 3-month period were invited to complete a questionnaire administered by WIC personnel during their clinic visit.

## **Results**

This analysis is based on the data obtained from all three surveys. All subjects were similar in terms of being active WIC participants during the time of the study. Sample size for each study was as follows: MI (n=1,521), Detroit (n=621), WA (n=327). Study participants were likely to be 18-34 years of age with a child of their own under 3 years of age (see Table 1).

**TABLE 1—Subject Characteristics**

|                        | Percentage of Valid Responses by Study |                    |               |
|------------------------|--|--------------------|---------------|
|                        | MI<br>(n=1,521)                        | Detroit<br>(n=621) | WA<br>(n=327) |
| Adult's age            |  |                    |               |
| <18 years              | 4.9                                    | 6.9                | 3.5           |
| 18-24 years            | 39.7                                   | 31.8               | 37.7          |
| 25-29 years            | 25.4                                   | 26.7               | 28.5          |
| 30-34 years            | 16.6                                   | 18.4               | 14.9          |
| 35-39 years            | 7.3                                    | 9.1                | 10.1          |
| 40-44 years            | 3.7                                    | 4.1                | 4.1           |
| 45-49 years            | 1.1                                    | 1.5                | 1.0           |
| 50+ years              | 1.4                                    | 1.4                | 0.3           |
| Child's age            |  |                    |               |
| Under 1 year           | 25.8                                   | 33.3               | 27.4          |
| 1 year                 | 14.7                                   | 16.8               | 24.6          |
| 2 years                | 13.9                                   | 17.0               | 23.1          |
| 3 years                | 9.3                                    | 12.9               | 15.0          |
| 4 years                | 6.8                                    | 7.9                | 9.6           |
| 5 years or older       | 1.6                                    | 4.0                | 0.4           |
| More than 1 child <6   | 27.9                                   | 8.1                | 11.9          |
| Relationship to child  |  |                    |               |
| Parent                 | 94.2                                   | 94.5               | 95.6          |
| Grandparent            | 2.5                                    | 2.7                | 3.4           |
| Guardian               | 2.1                                    | 1.2                | 1.0           |
| Other/Daycare provider | 1.2                                    | 1.4                | 0             |

**Table 1.**

**TABLE 2--Internet Characteristics**

|                              | Percentage of Valid Responses by Study |                    |               |
|------------------------------|--|--------------------|---------------|
|                              | MI<br>(n=1,521)                        | Detroit<br>(n=621) | WA<br>(n=327) |
| Own a computer               |  |                    |               |
| Yes                          | 53.5                                   | 41.8               | 56.4          |
| No                           | 46.5                                   | 58.2               | 43.6          |
| Internet access location     |  |                    |               |
| Home                         | 44.8                                   | 27.5               | 41.8          |
| Work                         | 5.4                                    | 5.2                | 6.0           |
| Library                      | 7.5                                    | 14.3               | 8.2           |
| Parent's home                | 8.3                                    | 3.7                | 7.3           |
| Friend's home                | 4.6                                    | 6.1                | 5.4           |
| WIC clinic                   | 0.1                                    | 0.2                | 0             |
| Other                        | 1.9                                    | 2.6                | 4.1           |
| Do not use the Internet      | 27.4                                   | 33.4               | 27.2          |
| Like learning from web pages |  |                    |               |
| Yes                          | 79.2                                   | 88.4               | 73.2          |
| No                           | 20.8                                   | 11.6               | 26.8          |

**Table 2**

WIC client point of access to the Internet differed significantly ( $\chi^2=58.7, df=8, p<0.001$ ) with greater access likely to occur from home, although access from a library, parent's home, friend's home, and worksite collectively accounted for 26%-29% of all access. Regardless of access point, it was found that over 2/3 of respondents (MI 72.6%, WA 72.8%, Detroit 66.6%) had some form of access to the Internet. What is defined in this paper as "easy access to the Internet" (home, work, parent's home, friend's home) varied by study, with the lowest easy access exhibited among Detroit study participants (49.6%) compared to respondents in Michigan (63.1%) and Washington (60.5%) studies.

A significant difference ( $\chi^2=121.0, df=35, p<0.001$ ) was observed across the three areas for computer use location by user age. However, in all three areas, younger clients were more likely to use the WIC clinic or their parent's computer to access the Internet compared to older clients who were more likely to use the Internet at home or work. Similarly, computer ownership varied significantly ( $\chi^2=28.0, df=2, p<0.001$ ) between areas, with Detroit participants (41.8%) reporting less ownership. In addition, computer ownership was associated with client age. Those under age 25 were less likely to own a computer than older persons.

The percentage of clients who liked learning from the Internet differed significantly ( $\chi^2=28.3, df=2, p>0.001$ ) between the three areas. Client enjoyment in learning from the Internet was also significantly associated with whether respondents owned a computer ( $\chi^2=147.9, df=1, p>0.001$ ). In general, those who owned a computer were much more likely to indicate liking to learn from web pages, although the Detroit sample reported owning a computer less frequently than those in the other areas, but also reported enjoying learning from the Internet more frequently than the others. Client age was marginally associated with whether clients like learning from the Internet ( $\chi^2=14.9, df=7, p=0.04$ ), with clients aged 40 and older being less so than their younger counterparts. In contrast, no association existed between the client's child's age and whether the client liked learning from the Internet ( $\chi^2=5.3, df=6, p=0.51$ ).

## Discussion

Results from these surveys provide evidence that supports the reality that a relatively high degree of Internet access exists among lower-income populations. Internet access findings from the Michigan survey (72.6%) can be generalized statewide. Similarly, Detroit Internet access results (66.6%) can be generalized across the total Detroit WIC population. In contrast, even though Washington Internet access results (72.8%) were similar to those of Michigan, the sample was not necessarily representative of the entire state and therefore can only be generalized to the few agencies that participated in the study. Regardless, these results the use of the Internet as for education, services, and behavioral change.

In general, it was found that older WIC populations were more likely than their younger counterparts to own a computer and access the Internet from home or work. In contrast, younger WIC clients were more likely than older clients to access the Internet from the WIC clinic or a parent's home, as well as enjoy learning from the Internet. Accessing the Internet from home was the most common access point across all three areas.

The high proportion of respondents who indicated they like learning from the Internet again confirms web-based education as a viable means for targeting WIC populations. These findings, combined with the results that younger populations have a greater likelihood of enjoying learning from the Internet, provide further impetus for using the Internet for targeting specific WIC populations.

The benefits of the study findings are relevant in that they **(1)** provide direction and support for using the Internet as a viable avenue for delivering nutrition education among low income populations, **(2)** confirm that the Internet has become more widely diffused to low income populations, and **(3)** attend to important health communication objectives for the nation as identified in Healthy People 2010.<sup>3</sup>

## References

1. Bernhardt J. Health education and the digital divide: Building bridges and filling chasms. *Health Educ Res.* 2000; 15:527-31.
2. National Telecommunications and Information Administration. A nation online: Entering the broadband age. Washington (DC): US De-

partment of Commerce; September 2004.

Available at:

<http://www.ntia.doc.gov/reports/anol/NationOnlineBroadband04.htm>. Accessed December 15, 2006.

**3.** US Department of Health and Human Services. Healthy People 2010. 2nd ed. Washington. (DC): US Government Printing Office; 2000.

**4.** Madden M. Internet penetration and impact. Washington (DC): Pew Internet & American Life Project; April 2006. Available at: [http://www.pewinternet.org/pdfs/PIP\\_Internet\\_Impact.pdf](http://www.pewinternet.org/pdfs/PIP_Internet_Impact.pdf). Accessed December 15, 2006.

**5.** Horrigan J. Home broadband adoption 2006. Washington (DC): Pew Internet & American Life Project; May 28, 2006. Available at: [http://www.pewinternet.org/pdfs/PIP\\_Broadband\\_trends2006.pdf](http://www.pewinternet.org/pdfs/PIP_Broadband_trends2006.pdf). Accessed December 15, 2006.

**6.** Kreps GL. Disseminating relevant health information to underserved audiences: Implications of the digital divide projects. *J Med Libr Assoc.* 2006; 93(supplement):S68-73.

**7.** U.S. Department of Health and Human Services. Expanding the reach and impact of consumer e-health tools. Rockville, MD: Office of Disease Prevention and Health Promotion; 2006.

**8.** Brodie M, Flournoy RE, Altman DE, Blendon RJ, Benson JM, Rosenbaum MD. Health information, the Internet, and the digital divide. *Health Aff.* 2000; 19:255-265.

**9.** Chaudhuri A, Flamm KS, Horrigan J. An analysis of the determinants of Internet access. *Telecommunications Policy.* 2005; 29:731-55.

**10.** Fox S. Digital divisions. Washington (DC): Pew Internet & American Life Project; October 5, 2005. Available at: [http://www.pewinternet.org/pdfs/PIP\\_Digital\\_Divisions\\_Oct\\_5\\_2005.pdf](http://www.pewinternet.org/pdfs/PIP_Digital_Divisions_Oct_5_2005.pdf). Accessed December 16, 2006.

**11.** Lenhart A. The ever-shifting Internet population. Washington (DC): Pew Internet and American Life Project; April 16, 2003. Available at: [http://www.pewinternet.org/pdfs/PIP\\_Shifting\\_Net\\_Pop\\_Report.pdf](http://www.pewinternet.org/pdfs/PIP_Shifting_Net_Pop_Report.pdf). Accessed December 14, 2006.

**12.** Lorence DP, Park H, Fox S. Racial disparities in health information access: Resilience of the digital divide. *J Med Syst.* 2006; 30:241-9.

**13.** National Telecommunications and Information Administration. A nation online: How Americans are expanding their use of the Internet. Washington (DC): US Department of

Commerce; February 2002. Available at: <http://www.ntia.doc.gov/ntiahome/dn/html/antononline2.htm>. Accessed December 14, 2006.

**14.** Pew Internet & American Life Project. Demographics of Internet users. Washington (DC): Pew Internet & American Life Project; April 26, 2006. Available at: [http://www.pewinternet.org/trends/User\\_Demo\\_4.26.06.htm](http://www.pewinternet.org/trends/User_Demo_4.26.06.htm). Accessed December 14, 2006.

**15.** Smith-Barbaro P, Licciardone JC, Clarke HF, Coleridge ST. Factors associated with intended use of a web site among family practice patients. *J Med Internet Res [serial online].* 2001; 3:e17. Available at: <http://www.jmir.org/2001/2/e17/>. Accessed December 14, 2006.

**16.** Birru MS, Steinman RA. Online health information and low-literacy African Americans. *J Med Internet Res [serial online].* 2004; 6:e26. Available at: <http://www.jmir.org/2004/3/e26/>. Accessed December 15, 2006.

**17.** Wyatt S, Henwood F, Hart A, Smith J. The digital divide, health information, and everyday life. *New Media & Society [serial online].* 2005; 7:199-218. Available at: <http://nms.sagepub.com/cgi/reprint/7/2/199.pdf>. Accessed December 15, 2006.

**Address reprints to:**

*Robert J. Bensley, Ph.D.  
Community Health Education  
Department of HPER  
Western Michigan University  
Kalamazoo, MI 49008*

**E-mail:** [robert.bensley@wmich.edu](mailto:robert.bensley@wmich.edu)