

# Health profile of deaf Canadians

## Analysis of the Canada Community Health Survey

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### ABSTRACT

**OBJECTIVE** To profile the health of deaf and hard-of-hearing Canadians in relation to the population as a whole.

**DESIGN** Using data from the Canada Community Health Survey 1.1, a cross-sectional survey conducted by Statistics Canada with a total of 131 535 respondents, a series of logistic regression models was fitted to estimate the odds, compared with the general population, of respondents classified as having hearing problems reporting the presence of various chronic health outcomes; of their utilizing the health care system; of their engaging in certain health promotion activities; and of their reporting certain perceptions about their overall health. For each odds ratio, 95% confidence intervals are provided. All analyses were adjusted for age and sex with some analyses being restricted to appropriate age ranges or having further adjustments made, depending on the outcomes.

**MAIN OUTCOME MEASURES** In addition to indications of deafness or hearing loss, this study examined health care utilization, several commonly accepted health outcomes, engagement in health promotion activities, and perceptions of overall health.

**RESULTS** Approximately 4% of respondents in the cross-sectional survey were considered to have hearing problems. The prevalence of hearing problems increased with age, with males having a slightly higher prevalence of hearing problems compared with females (4.52% versus 3.53%). Respondents classified as having hearing problems, whether hearing loss or deafness, were more likely to report adverse health conditions and low levels of physical activity, and to experience higher rates of depression. Respondents classified as having hearing problems were not more likely to smoke or to drink excessively.

**CONCLUSION** Communication is essential to both health promotion and health care delivery. Deafness—both the disability and the culture—creates barriers to communication. Individual practitioners can and should consider the communication needs of individual patients with hearing loss or deafness to avoid barriers to optimal health.

### EDITOR'S KEY POINTS

- How does having a hearing disorder affect health? This study found that Canadians with hearing loss were more likely to report depression and chronic diseases than other Canadians were. They were also more likely to report lower education levels, obesity, and lower rates of exercise, which are all determinants of health. On the positive side, Canadians with hearing loss were less likely to smoke or drink heavily, which might be a reflection of advertising geared for the hearing world.
- Reporting unmet health needs was more common among those with hearing loss, which could be a reflection of communication barriers that exist between hearing physicians and patients with hearing problems. Procedures requiring little communication (eg, Papanicolaou tests and mammograms) were similar in both groups.
- Specific accommodations (eg, signing interpreters, optimal lip reading environments, written information) might improve communication.

This article has been peer reviewed.

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*Can Fam Physician* 2007;53:2140-2141

# Profil de santé des Canadiens souffrant de surdité

## Analyse de l'Enquête sur la santé des collectivités canadiennes

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### RÉSUMÉ

**OBJECTIF** Établir le profil de santé des Canadiens sourds ou malentendants par rapport à la population générale.

**TYPE D'ÉTUDE** À l'aide des données de l'Enquête sur la santé des collectivités canadiennes 1.1, une enquête transversale menée par Statistique Canada auprès de 131 535 répondants, on a établi une série de modèles de régression logistique afin d'évaluer, par rapport à la population générale, les cotes des répondants rapportant divers problèmes de santé chroniques; leur utilisation du système de santé; leur participation à certaines activités favorables à la santé; et la façon dont ils jugent leur propre santé. Chaque rapport de cotes est accompagné de son intervalle de confiance à 95%. Toutes les analyses ont été ajustées selon l'âge et le sexe, certaines se limitant à des fourchettes d'âge appropriées ou ayant des ajustements supplémentaires selon les questions à l'étude.

**PRINCIPAUX PARAMÈTRES ÉTUDIÉS** En plus d'indiquer le degré de surdité ou de perte auditive, l'étude examinait l'utilisation des services de santé, plusieurs problèmes de santé courants, la participation à des activités favorables à la santé et l'idée que se font les sujets de leur santé globale.

**RÉSULTATS** On a considéré qu'environ 4% des répondants de cette enquête transversale avaient un trouble de l'audition. La prévalence des problèmes auditifs augmente avec l'âge, et est légèrement plus élevée chez les hommes que chez les femmes (4,52% vs 3,53%).

Les répondants classés dans le groupe avec troubles auditifs, que ce soit une surdité ou une perte auditive, étaient plus susceptibles de rapporter un mauvais état de santé et des faibles niveaux d'activité physique, et de présenter un taux plus élevé de dépression. Ils n'étaient pas plus susceptibles de fumer ou de boire de façon excessive.

**CONCLUSION** La communication est un élément essentiel de la promotion de la santé et de la prestation des soins. La surdité, comme incapacité et comme culture, constitue un obstacle à la communication. Chaque médecin peut et doit tenir compte des besoins de communication de chacun de ses patients atteints de surdité ou de perte auditive afin d'écartier tout obstacle à une santé optimale.

### POINTS DE REPÈRE DU RÉDACTEUR

- En quoi un trouble auditif peut-il affecter la santé? Cette étude a révélé que les Canadiens présentant une perte auditive ont tendance à rapporter plus de dépressions ou de maladies chroniques que leurs concitoyens. Ils sont également plus susceptibles de rapporter de l'obésité et un niveau inférieur de scolarité et d'activité physique, lesquels sont tous des déterminants de la santé. D'un autre côté, ils sont moins susceptibles de fumer ou de boire de façon excessive, ce qui pourrait refléter la publicité actuelle axée sur le monde des entendants.
- Les personnes souffrant de troubles auditifs ont rapporté plus souvent n'avoir pas eu de réponse à leurs problèmes de santé, ce qui pourrait correspondre aux obstacles à la communication qui existent entre le médecin qui entend bien et le patient malentendant. Les interventions requérant peu de communication (p. ex. tests de Papanicolaou et mammogrammes) étaient identiques dans les deux groupes.
- Certains accommodements spécifiques (p. ex. des interprètes connaissant le langage des signes, un environnement favorable à la lecture sur les lèvres, de l'information écrite) pourraient améliorer la communication.

Cet article a fait l'objet d'une révision par des pairs.  
Le texte intégral est accessible en anglais à [www.cfp.ca](http://www.cfp.ca).  
*Can Fam Physician* 2007;53:2140-2141

Optimal health is achieved through effective prevention, timely and accurate diagnosis, and effective treatment. Both health promotion and health care delivery are required for optimal health. Communication is essential to both receiving health promotion messages and delivering optimal health care. This includes accurate capture of patient history and symptoms by physicians, effective communication during diagnostic and therapeutic procedures, and reliable communication of home care and follow-up instructions.

Deafness—both the disability and the culture—creates barriers to communication. Among people who audiotically are *deaf*—with a lower case *d*—there are those who are styled *Deaf*, referring to their membership in a distinct culture organized around sign language.

That communication and culture can be determinants of health is reflected in the inclusion of literacy and ethnicity in many Statistics Canada population health surveys. Cross-sectional studies have used the same surveys to examine the health of other ethnic and cultural minorities and immigrant groups.<sup>1-3</sup>

Little is known about the health status of Canadians who have little or no hearing. Health care delivery obstacles and needs have previously been reviewed in detail,<sup>4</sup> and hospital accessibility discussed.<sup>5</sup> In studies and reviews of health of deaf and hard-of-hearing people elsewhere, deficits have been identified in relation to access to specific or general health services,<sup>6,7</sup> self-perceived health,<sup>8</sup> and health knowledge and beliefs.<sup>6,8</sup> Despite these findings, deafness and hearing loss are conventionally regarded as health concerns addressed by the disciplines of otology and audiology rather than attributes of the whole patient.<sup>4</sup>

Therefore this study set out to examine the health status of deaf and hard-of-hearing Canadians, compared with those without hearing deficits, using a cross-sectional analysis of the Canada Community Health Survey 1.1 (CCHS). This survey reports the estimated prevalence of deafness and hearing loss, as well as respondents' levels of health care utilization, engagement in health promotion activities, health status based on several commonly accepted health outcomes, and perceptions of overall health.

## METHODS

### Data source

This analysis used data from the CCHS, a cross-sectional survey conducted by Statistics Canada. A total

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of 131 535 respondents were contacted for interview between September 2000 and November 2001. The CCHS aimed to collect information from a representative sample of Canadians aged 12 or older, living in private occupied dwellings in all provinces and territories. The CCHS utilized a complex stratified, clustered sample design to select households for inclusion. The overall response rate for the CCHS was 84.7%.

Data from the CCHS master files were accessed in the Statistics Canada Research Data Centre located in Toronto, Ont. The exact wording and sequence of questions is available directly from Statistics Canada.<sup>9</sup>

**Hearing status.** The CCHS assesses hearing status using a series of 5 questions. The questions focus on what is heard and not heard and do not capture how communication optimally or most reliably happens. For example, respondents who are functionally deaf but use hearing aids would indicate through the questions that they can hear with a hearing aid, even though they might not be confident of their ability to hear reliably or to understand or they might not have access to their hearing aids at any given time. In addition, it is not possible to differentiate deaf and hard-of-hearing respondents using the questions in the CCHS; as a consequence, this analysis combines all responses indicating deafness or hearing loss (aided or unaided) into a single "hearing problem" category compared with respondents with no hearing loss. *Hearing problem* is the label used by Statistics Canada for this derived variable and will be adopted with the implications discussed later.

**Specific health outcomes, health care utilization, and health promotion activities.** Specific questions within the CCHS were extracted to examine the health of Canadians with deafness and hearing loss, outlined here in 3 main categories. First, we looked at health outcomes, both specific and holistic, reflecting the health status of this group. Health outcomes are the result of lifestyle and health promotion behaviours on the one hand, and access to the health care system on the other. Second, we looked at lifestyle and health behaviours, as they are the focus of public health programs and are themselves outcomes of access to public health. Third, we examined health care system utilization as an indicator of access to services. The specific variables and analysis are described in **Table 1**.

### Analysis

A series of logistic regression models was fitted to estimate the odds, compared with the general population, of respondents classified as having hearing problems reporting the presence of various chronic health outcomes; of their utilizing the health care system; of their engaging in certain health promotion activities; and of their reporting certain perceptions

about their overall health. For each odds ratio, 95% confidence intervals are provided. All analyses were adjusted for age and sex. In addition, adjustments were made as noted for other covariates (such as province of residence and marital status) where appropriate. Also, some analyses were restricted to subsets of the population (eg, mammograms only for females 50 years or older). These are identified specifically when applicable.

Given the complex nature of the sampling design, all results are weighted. The weights were developed by Statistics Canada to represent the entire Canadian population at the start of the observation period. The weights take into account sampling probabilities and nonresponse.

The complex nature of the sampling design also gives rise to a false increase in precision. To account for this,

**Table 1. Health outcomes, behaviours, and utilization: Variables and classification criteria.**

| VARIABLES (POPULATION SELECTION)  | CRITERIA TO RECORD AS POSITIVE  |
|---|---|
| Cancer, high blood pressure, diabetes, heart disease  | Diagnosed by a physician  |
| Other chronic health conditions   | Diagnosed by a physician; that have lasted or were expected to last 6 mo or more  |
| Injury  | Self-reported injury in last 12 mo  |
| Self-perceived general health   | Good, very good, or excellent   |
| Education   | Received some post-secondary education  |
| Smoker  | Smoking cigarettes daily or occasionally  |
| Obese   | Body mass index (self-reported weight in kg divided by the square of self-reported height in m) of 30 or greater  |
| Heavy alcohol consumption   | Self-reported consumption of 5 or more drinks on a single occasion, 2 or more times per wk  |
| Fruit and vegetable consumption   | Consuming at or above the daily recommended amount  |
| Physically inactive   | Respondents' leisure time physical activity in the past 3 mo expended less than 1.5 kcal/kg daily   |
| Life stress (among those 18 y or older)   | Quite a bit or extreme stress level   |
| Sense of belonging to their community   | Somewhat or very strong   |
| Low social support  | Below 50th percentile on the positive social interactions subscale  |
| Low emotional support   | Below 50th percentile on the emotional or information support subscale  |
| Depression  | Self-reported lack of interest in most things and reported 4 or more of the following symptoms: appetite or sleep disturbance, decreased energy, difficulty concentrating, feelings of worthlessness, suicidal thoughts |
| Disability or health problem as a barrier to action to improve health (among respondents reporting a barrier) | Had not done anything in past 12 mo to improve health, owing to a barrier; cited disability or health problem as the barrier  |
| Hysterectomy (among women 25–65 y)  | Had hysterectomy  |
| Papanicolaou test (among women sexually active in last 12 mo)   | Had test in the past 3 y  |
| Mammogram (among women 50 y or older)   | Had mammogram in the past 2 y   |
| Prostate-specific antigen test for prostate cancer (among men 50 y or older)                                  | Had test in the past 2 y  |
| Flu shot (among Ontario residents)  | Ever had a flu shot   |
| Primary care access   | Reported at least 1 family doctor or general practitioner visit in the past 12 mo   |
| Unmet health care need (among those 18 y or older)  | Affirmative response to question asking whether in the last 12 mo they felt they needed health care but did not receive it  |

a weighted bootstrap technique with 500 replicates was employed to adjust variance estimates of the model parameters.

A list-wise deletion was employed, deleting any observation that did not provide complete responses to all covariates included in each model. This gives rise to differing sample sizes presented with each model.

## RESULTS

There were a total of 131 535 respondents in the CCHS 1.1. Of these, 113 respondents did not provide enough information to determine whether they had hearing problems or not. As a result, these respondents were excluded from all subsequent analysis leaving a total of 131 422 respondents.

Overall, approximately 4% of respondents were considered to have hearing problems. **Table 2** provides a breakdown of the total sample by age and sex, indicating the proportion of respondents with hearing problems. The prevalence of hearing problems increases with age. Males have a slightly higher prevalence of hearing problems compared with females (4.52% versus 3.53%), although females have a higher prevalence of hearing problems at an earlier age compared with males.

**Table 3** reports the odds ratios for the population, adjusted for age and sex (except as noted), for having hearing problems and certain specific health outcomes; of their utilizing the health care system; of their engaging in certain health promotion activities; and of their reporting certain perceptions about their overall health. Respondents reporting hearing problems were significantly more likely to report heart disease, the presence of chronic conditions, being injured in the past 12 months, and to experience depression compared with respondents not reporting hearing problems. Respondents reporting hearing problems were significantly less likely to report having more than secondary

school education, to consume large amounts of alcohol, or to report being cigarette smokers. Respondents reporting hearing problems did not show any differences compared with respondents not reporting hearing problems when considering life stress, sense of belonging, and emotional and social support.

## DISCUSSION

The CCHS 1.1 estimated that 4% of Canadians have hearing problems to a degree that prevents them from communicating in groups of 3 or more people without the use of hearing aids. This is consistent with earlier studies that estimated prevalence in the range of 4% to 5% for moderate or greater hearing loss.<sup>10,11</sup>

Across all ages, depending on the auditory threshold used as a definition, an additional 3% to 9% might have less severe hearing impairments.<sup>1</sup> The lower prevalence in this study might indicate that the sampling frame was inadequate to acquire responses from some segments of the deaf population. Approximately 37% of interviews were conducted by telephone, a factor that might have affected the survey's ability to select respondents with hearing loss, but no other Canadian surveys of this size attempt to reach this population. It is unclear whether the household would be bypassed at the time of conducting the survey if the household had no telephone or if it had only a text telephone device, as used by many deaf people to communicate by text over telephone lines.

It is possible that the most vulnerable element of the deaf population has been excluded from these results. Conducting interviews by telephone might create a systemic bias that avoids some deaf households. With the low prevalence of deafness and hearing loss, it might be appropriate to intentionally oversample the deaf population in future CCHS cycles to correct for the possibility that these responses could be biased to the

**Table 2. Hearing problems by age and sex: N = 131 422.**

| AGE GROUP (Y)  | MALES  |                        | FEMALES |                        | TOTAL   |                        |
|----------------|--------|------------------------|---------|------------------------|---------|------------------------|
|                | NO.    | % WITH HEARING PROBLEM | NO.     | % WITH HEARING PROBLEM | NO.     | % WITH HEARING PROBLEM |
| 11-20          | 9798   | 1.00                   | 9060    | 1.22                   | 18 858  | 1.10                   |
| 21-30          | 10 464 | 1.13                   | 10 516  | 1.68                   | 20 979  | 1.41                   |
| 31-40          | 12 525 | 1.72                   | 12 530  | 1.45                   | 25 056  | 1.58                   |
| 41-50          | 12 566 | 2.49                   | 12 654  | 1.97                   | 25 220  | 2.23                   |
| 51-60          | 8874   | 4.95                   | 8938    | 3.50                   | 17 812  | 4.22                   |
| 61-70          | 5714   | 10.87                  | 6218    | 4.54                   | 11 932  | 7.57                   |
| 71-80          | 3596   | 20.01                  | 4818    | 10.70                  | 8414    | 14.68                  |
| 81-90          | 1088   | 32.00                  | 1798    | 24.84                  | 2886    | 27.54                  |
| ≥ 91           | 85     | 58.77                  | 180     | 45.60                  | 265     | 49.81                  |
| All age groups | 64 710 | 4.52                   | 66 712  | 3.53                   | 131 422 | 4.02                   |

characteristics of those deaf and hard-of-hearing people who have a normal-hearing person in the household.

A higher prevalence of depression was seen in the deaf and hard-of-hearing group. While there is no reason to expect lower incidence,<sup>12</sup> reporting more

depression could reflect interpersonal barriers at school, in the workplace, and in the community, such as being excluded or the cost of adapting when included. Barriers to work force participation were more pronounced with greater hearing deficit in the United States,<sup>13</sup> and deaf

**Table 3. Odds ratio estimates for the relationship between having a hearing problem and various health outcomes, health promotion activities, health care utilization, and perceptions of overall health: All models have been adjusted for age and sex.**

| VARIABLE  | N       | ODDS RATIO | 95% CONFIDENCE INTERVAL | ADDITIONAL ADJUSTMENTS      |                |
|---|---------|------------|-------------------------|-----------------------------|----------------|
| <b>Specific health outcomes</b>                     |         |            |                         |                             |                |
| • Cancer  | 131 272 | 1.16       | 0.96-1.39               | Smoking status              |                |
| • High blood pressure                               | 131 208 | 0.97       | 0.87-1.07               |                             |                |
| • Diabetes  | 131 351 | 0.99       | 0.86-1.14               |                             |                |
| • Heart disease                                     | 131 345 | 1.31       | 1.17-1.48               |                             |                |
| • Chronic condition                                 | 127 720 | 1.69       | 1.50-1.91               |                             |                |
| • Injury  | 131 387 | 1.21       | 1.07-1.36               |                             |                |
| • Depression  | 128 854 | 1.59       | 1.36-1.85               |                             |                |
| • Hysterectomy                                      | 41 676  | 1.23       | 0.97-1.56               |                             |                |
| <b>Health promotion activities</b>                  |         |            |                         |                             |                |
| • Education   | 130 322 | 0.61       | 0.56-0.66               | Education, income, province |                |
| • Fruit and vegetable consumption                   | 130 041 | 1.02       | 0.94-1.11               |                             |                |
| • Physically inactive                               | 120 566 | 1.14       | 1.01-1.29               |                             |                |
| • Heavy alcohol consumption                         | 100 022 | 0.82       | 0.70-0.97               |                             |                |
| • Smoker  | 117 449 | 0.87       | 0.78-0.96               |                             |                |
| • Obese   | 93 665  | 1.27       | 1.09-1.48               |                             |                |
| <b>Health care utilization</b>                      |         |            |                         |                             |                |
| • Primary care consultation                         | 131 111 | 1.52       | 1.35-1.71               | Province, income            |                |
| • Disability cited as a barrier to improving health | 24 749  | 1.60       | 1.24-2.06               |                             |                |
| • Prostate-specific antigen blood test              | 18 118  | 0.91       | 0.79-1.03               |                             |                |
| • Flu shot  | 50 029  | 1.57       | 1.35-1.83               |                             |                |
| • Papanicolaou test                                 | 17 813  | 0.84       | 0.57-1.24               |                             |                |
| • Mammogram   | 22 858  | 0.90       | 0.79-1.02               |                             |                |
| <b>Perceptions of overall health</b>                |         |            |                         |                             |                |
| • Sense of belonging to the community               | 119 941 | 0.98       | 0.90-1.07               | Province                    |                |
| • Life stress                                       | 118 858 | 1.00       | 0.90-1.10               |                             |                |
| • Self-perceived general health                     | 131 395 | 0.54       | 0.49-0.60               |                             |                |
| • Self-perceived unmet health care needs            | 131 337 | 1.31       | 1.17-1.46               |                             |                |
| • Low emotional support                             | 72 559  | 0.97       | 0.87-1.07               |                             | Marital status |
| • Low social support                                | 72 913  | 1.02       | 0.92-1.14               |                             | Marital status |

Canadians are also believed to experience barriers to equal rates of employment.<sup>14</sup> Deaf people in the workplace have a marked impression of not making full use of their abilities and skills.<sup>14,15</sup> Both hard-of-hearing and deaf people might experience psychological strain and fatigue from the demands of adapting to the hearing environment.<sup>16</sup> Part of this strain is linked to the stigma of hearing loss or hearing aids or the fear of being stigmatized.<sup>17,18</sup> Those reporting hearing loss did not report less social or emotional support or sense of belonging. Close support networks, often consisting of other deaf and hard-of-hearing people or those who understand and can promote inclusion, are often cited as major assets for adjustment to hearing loss.<sup>15,16,18,19</sup>

Deaf and hard-of-hearing Canadians are not more likely to smoke or drink excessively, a finding consistent with previous studies,<sup>20</sup> but they do report poor adherence to recommendations for healthy body mass and exercise. It is unclear whether this indicates that some health promotion measures are not reaching this subset of Canadians, or whether it reflects a reduced sensitivity to marketing in general, given that such messages are used to promote healthy activities and nutrition promotion, as well as to advertise cigarettes and alcoholic beverages. Previous studies have shown that the deaf and hard-of-hearing have difficulty understanding physicians<sup>20</sup> and have lower awareness of the importance of health promotion and disease prevention procedures and behaviours.<sup>6</sup>

It is apparent that respondents classified as having hearing problems, whether hearing loss or deafness, are also more likely to report health conditions diagnosed by physicians, including heart disease, diabetes, high blood pressure, and other chronic conditions (but not cancer). Respondents with hearing problems are therefore seeing physicians for diagnosis, but this study was not able to assess why the rates of these chronic conditions were higher in this group, after controlling for age and other variables. This group could have higher rates of these conditions, but, conversely, respondents without hearing problems could conceivably be underdiagnosed for other factors not applicable to deaf and hard-of-hearing people.

On several specific utilization indicators, deaf and hard-of-hearing people reported comparable access, but it should be noted that the health care procedures reflecting comparable access were not communication-intensive clinical encounters. Canadians with hearing loss are getting prostate-specific antigen tests, Papanicolaou tests, and mammograms at comparable rates to those of the general population (as found in previous studies<sup>6</sup>). Ontario residents with hearing loss had greater access to flu shots, but these can be obtained without physician contact. This data set does not enable us to analyze the quality of communication. Although contact occurs, it might not occur as often as

would be appropriate or reflect equal quality of communication. For instance, a study of community mental health services found that access for deaf people disproportionately consisted of case management rather than clinical services.<sup>12</sup>

Some prior research<sup>20</sup> did not find lower physician utilization among deaf and hard-of-hearing people. Our data set did not include an indicator of the rate of utilization, but those respondents with any degree of hearing problem were more likely to report unmet health needs (defined as a time in the previous year when they needed health care that they did not receive), were more likely to cite disability or health problem as the reason for unmet health needs, and were much less likely to describe their health as "good" or better. One explanation for the latter finding could be that communication barriers allow lingering uncertainty about health experiences and prevent professionals from reassuring the worried well individual. Zazove et al<sup>20</sup> hypothesized that repeat visits seeking to resolve uncertainty could account for elevated utilization.

The Supreme Court of Canada has affirmed that deaf people who require it are entitled to access to sign language interpreting in the health care system.<sup>21</sup> Appropriate accommodations for non-signing deaf and hard-of-hearing people predominantly include real-time captioning and other text media, as well as optimal lip reading environments. Text access is rarely found in health promotion or health care delivery, save for pamphlets and consent forms. Surveys of physicians reflect unrealistic beliefs about the effectiveness of lip reading.<sup>22</sup> Optimal lip reading is often elusive, no less in the health care setting than in others, as it might be confounded by face masks, facial hair, accents, poor lighting, and background noise, not to mention unfamiliar terminology and possible anxiety over the situation.


Unfortunately, the current CCHS questions do not afford separate analysis of the health status or access experience of signing versus non-signing deaf people, people with congenital or developmental hearing loss versus people with recent or long-ago-acquired hearing loss, or people with moderate hearing loss versus people with no residual hearing. Simple screening questions cannot adequately define group membership. Use of hearing aids in some situations does not indicate benefit from hearing aids in all situations. A hearing loss that does not benefit from hearing aids does not indicate the ability to sign. Those who can respond in writing cannot necessarily understand complex written information. Those who can speak cannot necessarily hear.

The results in this study should be viewed in light of the cross-sectional design, in which causality cannot be determined. Further, given the difficulties that arise when performing telephone interviews, a potential bias might result if those with hearing loss could not adequately be sampled. Statistics Canada does make every

effort to interview selected respondents in a form that is agreeable to both parties (eg, face to face) and therefore expects this bias to be minimal.

## Conclusion

This analysis of a large national survey demonstrates that Canadians who experience hearing problems also experience a different and in some cases less favourable health status compared with Canadians without hearing problems. Reasons for these differences are difficult to assess given the current measures used in national surveys. Future research should focus on the reasons for these health disparities in an effort to alleviate them. Awareness on the part of family physicians could be valuable in assisting patients with deafness and hearing loss to access the health care system, including hospitals, specialists, and health promotion information.

Individual practitioners can and should consider the accommodation needs of individual patients with hearing loss or deafness. Development of a national or systemic approach to accommodations, however, depends on knowing which obstacles are affecting which subgroups in pursuit of good health, and this will require more specific identification in future CCHS cycles. 

## Acknowledgment

*This study was carried out with funds from the Social Sciences and Humanities Research Council of Canada through Ryerson University. While the research and analysis are based on data from Statistics Canada, the opinions expressed are those of the authors and do not necessarily represent the views of Statistics Canada.*

## Contributors

*Both authors made substantial contributions to concept and design of the study, analysis and interpretation of data, drafting and critical revision of the article, and approval of the final submission for publication.*

## Competing interests

*None declared*

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