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Disability days in Canada associated with dental problems: a pilot study

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Abstract: *Objective:* The aim of this study was to explore disability days, or bed days and cut-down days, associated with dental problems in Canada. *Methods:* Data were collected through a national telephone interview survey of 1005 Canadians aged 18 years and over using random digit dialling. Participants were asked to enumerate the number of disability days associated with dental problems in the previous 2-week period. Descriptive and bivariate logistic regression analyses were undertaken. *Results:* In the previous 2-week period, 33 people, or 3.3% of the sample, reported spending a day in bed because of a dental problem. Of these, 22 people also reported having to cut down on their normal activity because of the dental problem. It appears that younger age groups, those with the lowest incomes, college educations, no dental insurance, oral pain and a history of visiting a hospital emergency room for a dental problem, were all more likely to report a dental disability day. *Conclusions:* These data demonstrate the potential economic impacts of dental problems in Canada, yet they must be interpreted with caution because of the very low prevalence of the main outcome measure, the potential for selection bias and the relative inconsistency with existing historical estimates.

Key words: access to dental care; dental insurance; dental problems; disability days; economic impact

Introduction

Canada has recently entered a period of public dental health care renewal. Professional, governmental and social interest is now being directed to publicly financed dental care. To be sure, since 2004, all ten provincial jurisdictions have experienced public debate on issues of access to dental care, and half of them have introduced targeted investments in dental care (1).

In this period of renewal, policy leaders have developed an interest in the economic implications of dental problems at the population level. In this regard, this pilot study is an attempt to estimate the number of disability days associated with dental problems in Canada. Disability days – or days spent in bed (bed days) and days in which normal activity was restricted (cut-down days) – represent an indirect economic measure, because the measure assumes that such days limit individual and social productivity (e.g. limiting the tasks of daily living, work absenteeism) (2, 3).

Methods

Data were collected in April 2008 from a national, regionally stratified sample of Canadian adults by means of a telephone interview survey

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using random digit dialling and computer assisted telephone interview technology (n = 1005, ≥18 years; assumes maximum variance and a 95% confidence interval of ±3%). A private firm was employed to collect the data as part of its weekly national omnibus survey. The participation rate for this weekly survey is approximately 3%, meaning that 32 000–44 000 numbers are dialled to gather a sample of approximately 1000. Among attempted calls, approximately 21 000 are busy signals, no answer, answering machines or invalid numbers. Willingness to participate in the survey is taken to imply consent, and no personal identifiers are collected. The data received by the researchers were weighted to replicate regional population distributions, by age and gender, according to 2001 Canadian Census data. The study received expedited review and approval from the Office of Research Ethics at the University of Toronto in March 2008.

Questions on all-cause disability days from the Canadian Community Health Survey, Canada's national survey on health, were modified to query the same concept in relation to dental problems (4). The estimate of disability days referred to the previous 2-week period. The basic question was: 'During the last 2-week period, did you stay in bed at all because of a dental problem, including any nights spent as a patient in a hospital?' If the answer was 'yes,' the respondent was asked: 'How many days did you stay in bed for all or most of the day?' Follow-up questions asked: 'Not counting days spent in bed, during this 2-week period, were there any days that you cut down on things that you normally do because of a dental problem?' and 'How many days did you cut down on things for all or most of the day?' Importantly, this way of estimating disability days includes all manner of dental problems, from toothaches to adjusted orthodontic appliances. This means that the disability day could have been caused by visiting an oral health care provider and not because a person did not attend. This also means that this estimate of disability days must be considered non-specifically and globally, namely it cannot be linked to issues of access to dental care directly.

Using SPSS 16.0.1 (SPSS Inc., Chicago, IL, USA), descriptive and logistic regression analyses were undertaken. As a result of the very low prevalence of positive responses, only bivariate logistic regression odds ratios are presented (i.e. confidence intervals were too large in multivariate analyses to provide any meaningful interpretation). The following self-reported characteristics were thus tested independently for their ability to predict the outcome of experiencing a 2-week dental disability day: Gender, Age, Education, Income, Employment status, Dental insurance, Oral hygiene status, Last dental visit, Painful aching in mouth within previous month and Past emergency room visit for dental problem.

This study did not derive an estimate of total disability days associated with dental problems in Canada. As will be outlined in our discussion, confidence in any such estimate was extremely limited as a result of the low prevalence of positive responses, the possibility for selection bias (use of land lines only) and in terms of accurate comparisons with other population-based surveys (3, 5, 6).

Results

Table 1 demonstrates that most of the sample were women (52%), over 35 years of age (69%), college or university educated (61%), employed (66%) and earned greater than $40 000 per year (54%). From a dental perspective, this sample of Canadian adults reflected well-established population estimates (2, 7): most reported their oral health as good to excellent (87%); most had visited the dentist within the past year (71%); very few reported oral pain (5%); the majority accessed dental

Table 1. **Sample characteristics (n = 1005)**

	n (%)*
Gender	
Men	486 (48.3)
Women	519 (51.7)
Age	
18–24	95 (9.5)
25–34	199 (19.8)
35–44	186 (18.5)
45–49	106 (10.6)
50+	404 (40.2)
Education	
<H.S.	301 (29.9)
College	257 (25.6)
University	267 (26.6)
Post Grad	88 (8.8)
Income	
<20K	95 (9.4)
20–39K	184 (18.3)
40–59K	175 (17.4)
60–79K	113 (11.2)
80K+	255 (25.4)
Employment status	
Employed	550 (54.7)
Self-employed	116 (11.5)
Unemployed	57 (5.7)
Retired	183 (18.2)
Dental insurance	
Private insurance	563 (56.0)
Out of pocket	366 (36.4)
Public insurance	48 (4.8)
Oral hygiene status	
Poor/fair	130 (12.9)
Good/excellent	869 (86.5)
Last dental visit	
Never	8 (0.8)
5 or more years ago	79 (7.9)
3–5 years ago	55 (5.4)
1–3 years ago	147 (14.6)
Less than 1 year ago	711 (70.7)
Painful aching in mouth	
Never/hardly ever	800 (79.6)
Fairly/very often	50 (4.9)
Emergency room visit for dental problem	
No	950 (94.5)
Yes	54 (5.4)

*Percentages may not equal 100 because of non-respondents.

care through employment-based insurance (56%); some through out-of-pocket expenditures (36%) and very few through public assistance (5%). Interestingly, 5% of the sample reported having to visit an emergency room in the past for a dental problem not associated with trauma.

Table 2 describes dental disability days in Canada. In the previous 2-week period, 33 people, or 3.3% of the sample, reported spending a day in bed because of a dental problem. Of these, slightly less than half, or 15 people, reported having to stay in bed for 1 day, and a remaining 13 between 2 and 7 days. In addition to the bed day(s) during the 2-week period, 22 people also reported having to cut down on their normal activity for most or all of the day because of the dental problem. Of these, half, or 11 people, reported having to cut down for 4 days. Importantly, 28 of the 33 people that reported a dental disability day were employed, two were retired, one was unemployed and two did not report their status.

Table 3 describes the odds of reporting a 2-week dental disability day. All variables in Table 1 were tested independently for their ability to predict this outcome. It appears that younger age groups are more likely to report a dental disability day, as are those with the lowest incomes, those with college educations, those that pay for dental care out-of-pocket, those with oral pain and those who had visited an emergency room for a dental problem.

Table 2. **Two-week dental disability days in Canada**

	n	Percentage
Bed day		
Yes	33	3.3
No	968	96.3
Don't know/refused	4	0.4
Total	1005	100.0
Days spent in bed		
1	15	45.5
2	3	9.1
3	3	9.1
4	2	6.1
5	2	6.1
7	3	9.1
14	1	3.0
Don't know/refused	4	2.1
Total	33	100.0
Cut-down day		
Yes	22	66.7
No	10	30.3
Don't know/refused	1	3.0
Total	33	100.0
Days cut down		
1	1	4.5
2	1	4.5
3	0	0.0
4	11	50.0
5	0	0.0
7	4	18.2
14	4	18.2
Don't know/refused	1	4.5
Total	22	100.0

Table 3. **Odds of reporting a 2-week dental disability day**

Variables	Unadjusted OR [95% CI]	*P*-value
Age		
18–24	6.2 [2.0, 19.9]	0.002
25–34	6.1 [2.2, 17.0]	0.001
35–44	1.1 [0.2, 4.8]	0.940
45–49	2.9 [0.8, 11.3]	0.108
50 and above	Reference	
Income		
Less than $20 000	7.8 [2.6, 23.5]	0.001
$20–40 000	1.2 [0.3, 4.6]	0.825
$40–60 000	1.3 [0.3, 5.0]	0.690
$60–80 000	1.7 [0.4, 6.9]	0.476
$80 000 or more	Reference	
Education		
High school or less	1.1 [0.3, 3.9]	0.888
College	4.6 [1.7, 12.7]	0.003
University	Reference	
Dental insurance		
Public insurance	1.7 [0.2, 13.6]	0.603
Out-of-pocket	5.4 [2.3, 12.5]	0.001
Private insurance	Reference	
Painful aching in mouth		
Fairly often/very often	11.9 [4.3, 32.9]	0.001
Never/hardly ever	Reference	
Emergency room visit for dental problem		
Yes	4.4 [1.7, 11.1]	0.002
No	Reference	

Discussion

This is the first study of its kind in Canada, providing a description of the potential economic implications of dental problems in the country. As demonstrated, a relatively low percentage (3.3%) of this sample of Canadian adults reported one or more dental disability days within a 2-week period. Comparatively, Statistics Canada reported that, in 2005, 16.7% of Canadians 12 years and over reported one or more 2-week disability days because of general illness or injury (8).

Not surprisingly, those with the lowest incomes and those reporting oral pain were more likely to report a 2-week dental disability day. As well, those lacking public or private dental insurance were more likely to report such an experience, pointing to the importance of insurance in accessing dental care. Interestingly, those that had visited an emergency room in the past – an issue that has recently gained prominence in North American dental care policy circles (9–11) – were also more likely to report a 2-week dental disability day. It can thus be argued that when combined with a lack of insurance and emergency room visits for dental problems, experiencing a bed day or cut-down day because of a dental problem may be part of the general experience of oral health and dental care disparity in North America.

In terms of other literature on the subject, Reisine (3) reported that the 1981 United States National Health Survey estimated an annual 6.73 million days of bed disability and 17.7 million days of restricted activity as a result of dental problems. Using the 1989 United States National Health Survey,

Gift *et al.* (12) estimated the number of restricted activity days, or when a dental problem or visit reduced normal activity by more than one-half day, and reported a total of 41.4 million days of restricted activity annually. In 2000, the Surgeon General's Report on Oral Heath in America (5) reported that the 1996 United States National Health Interview Survey estimated an annual 4.6 million bed days and 9.7 million restricted activity days as a result of acute dental conditions. While this study did not provide an estimate of total disability days associated with dental problems in Canada, extrapolating its sample's findings to the Canadian population suggests a potential 23.4 million disability days because of dental problems, a figure which is much larger than any of the American estimates. Even with the variation in the American estimates (which assumedly results from different definitions of the activity limitations imposed by dental problems and the nature of the dental problems themselves), this study's estimate would appear unrealistic.

In this regard, it is important to consider this study's limitations, the most significant being the very low prevalence of the outcome under consideration. With only 33 cases, to some extent, any conclusions must be regarded with caution. There is also increasing concern that telephone interview surveys are not as representative as they used to be, especially as more people opt for cellular telephones instead of conventional landlines. For example, without weighting the raw data to replicate the age distribution of the population, the data are clearly over-represented by older adults (Table 1). Selection bias is also important here as well: by calling people at home, this arguably increases the chances of catching 'the disabled person at home'. The validity of the findings is also brought into question when one considers why 11 people who reported spending a day in bed did not report having to reduce their activities (having a cut-down day) as well. It would also seem counterintuitive to see individuals at home spending all or most of 14 (or even 7) days in bed with a toothache. Ultimately, it would be ideal for such a topic to be explored through a large-scale national population-based survey, an opportunity that will soon be available through Statistic Canada's Canadian Measures Health Survey, which included a question on 'time taken away from work, school or normal activities for dental check-ups or treatments or because of problems' (6).

Nevertheless, this study's data does provide a unique perspective into the experience of dental problems and their impacts. For example, it is clear that most of the significant disability associated with dental problems is experienced in a relatively short time period (i.e. 1 day), but that its morbidity is prolonged (i.e. 4 days or more) (Table 2). In addition, these data demonstrate the unique linkages of experiencing a dental disability day with existing and newly explored issues in oral health and dental care disparities (e.g. the role of income and insurance status, and emergency room visiting for dental problems). At the very least, these data demonstrate that dental problems are experienced both acutely and chronically, and that access to dental insurance or public care may go some way in mitigating the potential individual and economic impacts of such distress.

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