

Dental Caries, Problems Perceived and Use of Services among Institutionalized Elderly in 3 Regions of Quebec, Canada

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ABSTRACT

Objectives: To determine the changes, since 1980, in the number of nontreated caries in elderly people who have retained their teeth and are in residential and long-term care centres (CHSLDs) in the province of Quebec, Canada, and the changes in their perception of their oral health problems and use of dental services.

Methods: A secondary analysis of data from a 2004–2005 survey about the oral health problems of people who were at least 65 years of age and living in CHSLD institutions in the Montreal, Montérégie and Quebec City regions was done. The inclusion criterion for the secondary analysis was that the residents had to have at least 1 natural tooth. Data from the 152 residents who met the inclusion criterion were analyzed, and compared with those from a similar study done in 1980.

Results: Since 1980, the average number of teeth retained rose from 11.05 (SD 6.78) teeth to 12.91 (SD 7.82) in 2004. The average number of decayed teeth requiring treatment fell from 2.43 (SD 2.88) to 1.62 (SD 2.53); 49.3% (75/152) of the elderly participants had caries, compared with 74.1% in 1980. Only 3.4% (5/149) of the participants reported problems with, or pain or discomfort in their gums, compared with 8.9% in 1980. About half (48.7% or 74/152) of the participants examined needed periodontal treatment; 63.8% (83/130) had had recourse to services within the previous 5 years. The last time care was sought was, on average, 7.1 years ago, compared with 11.0 years in 1980.

Conclusions: Between 1980 and 2004, the number of retained teeth increased and the number of untreated caries fell among institutionalized elderly people. Their perception of the need for dental care remained poor. Their use of services improved, but was not ideal, given the numerous oral health problems diagnosed in this population.

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Results of the last study of the oral health of all elderly people in the province of Quebec, Canada, done in 1980,^{1,2} reveal major problems: a high rate of edentulism, numerous dental caries, increased periodontal diseases, an absence of dentures, inadequate dentures, poor use of dental care services, and

a considerable gap between diagnosed and perceived needs. People who are in the process of losing their autonomy and are housed in institutions live in a more difficult situation than people who remain in their own homes. A more recent study³ describing the overall oral problems of the institutionalized elderly

in 3 regions of Quebec shows similar results. Several studies⁴⁻¹² have highlighted the changes in the oral health of elderly people in industrialized countries. We have observed a worldwide trend toward less edentulism over the past few years.

Financial and organizational access to diagnostic and curative dental care services is very limited for the elderly population of Quebec, particularly for those living in an institution. Dental services are not covered by public dental care programs run by the Régie de l'assurance-maladie du Québec (RAMQ), and less than 7% of elderly people have private dental insurance coverage.¹³ Few long-term care centres offer dental services, whether for oral health care examinations upon admission, periodic checkups or treatments.

The purpose of the current study was to determine the changes, since 1980, in the number of nontreated caries in elderly people who still have at least 1 natural tooth and are in residential and long-term care centres (centres d'hébergement et de soins de longue durée, or CHSLDs) in the province of Quebec, Canada, and the changes in their perception of their oral health problems and use of services in the previous 5 years. The current study is a secondary analysis of data from a principal survey³ of the oral health problems of people who were 65 years of age and older, and resided in CHSLDs in Quebec in 2004.

Methods

2004 Survey

Participants for the 2004 survey resided in 38 CHSLDs in Montérégie and Montreal, which were chosen at random and invited to participate. Of these 38 centres, 37 (22 centres in Montérégie and 15 in Montreal) agreed to participate. One CHSLD linked to a hospital specializing in geriatric care in Quebec City also joined the study. The residents of the chosen CHSLDs were also randomly selected by those in charge of each facility. Excluded from the study were people with the following characteristics: being less than 65 years of age, residents of the CHSLD for less than 3 months, and incapable of understanding the objectives of the study and of giving informed consent; having a mandate in case of incapacity; being unable to provide signed consent by proxy; and not being fit enough to undergo a dental examination. Sixty-five percent of the original random selection were excluded; the total number of participants selected for the 2004 survey was 415 residents.

In January 2004, 4 dentists or examiners participated in 2 training sessions on the indicators for dental caries and periodontal illnesses, oral lesions, and oral and prosthetic treatments. Given the small number of examiners and people with natural teeth examined, recorded data could not be calibrated. Percent agreement among the examiners, however, was verified and found acceptable.

In January 2004, a pilot study to validate the questionnaire was done. Data were collected between February and October 2004. A consent form containing descriptions of the various elements of the study was first signed by the residents or their legal representative. The questionnaire included several sections: personal and demographic information, hygiene habits, recourse to services and perceived problems.

The oral examination itself included a section dealing with the condition of the mouth and teeth, and the participants' diagnostic needs. The examination was designed to be appropriate for the age of the population studied and the conditions of the environment in which the examination had to be carried out. It included neither radiography nor the use of a periodontal probe. The average time for administering the questionnaire after the oral examination was 15 minutes. The examinations were carried out either in a room reserved for that purpose or directly in the participants' rooms.

This study was carried out in accordance with the requirements for dentists working in public health in Quebec. Ethical issues were considered and ethical research methods were developed. Signed informed consent was first obtained from each resident, or his or her proxy. Examining dentists informed participants about their oral condition and, in the case of a diagnostic problem, issued a report to those in charge of their institution.

Descriptive analyses of the data with averages and percentages were used to characterize the study population. Data were verified and entered into a computer, and validated and processed with SPSS, version 13.0 in a Windows environment.

Secondary Analysis

The current study consists of a secondary analysis of data from the 2004 survey described above.³ The inclusion criterion for the secondary analysis was that the residents had to have at least 1 natural tooth. Of the 152 participants who met the inclusion criterion, 77 came from the Montérégie region, 63 from the Montreal region and 12 from the Quebec City region. Data from the 152 residents were analyzed, and compared with those from a similar study done in 1980.^{1,2}

Results

Characteristics of the Sample

People older than 85 years of age made up 35.7% (51/143) of the sample; 65% (99/152) of the participants were women. The language used by the majority (80.9% or (123/152) of people in the sample was French. Over 82.3% (125/152) of the participants had less than 12 years of schooling. The majority, 75% (114/152) of participants, had been residents of CHSLDs for less than 5 years. A small minority had private dental insurance, and most of the residents ignored the availability of financial aid

Table 1 Decayed, missing and filled teeth (DMFT) of participants with at least 1 natural tooth ($n = 152$)

	DMFT 2004 ³ (SD)	DMFT 1980 ^{1,2} (SD)
Decayed	1.62 (2.53)	2.43 (2.88)
Missing	19.10 (7.82)	20.95 (6.78)
Filled	4.14 (5.15)	2.15 (3.89)
Healthy	7.14 (5.61)	6.47 (5.51)
Total DMFT	24.86	25.53

SD = standard deviation

based on income from pensions in their institutions to cover special needs such as oral health care. Few elderly people smoked cigarettes regularly, and the number of cigarettes smoked was relatively low. Almost two-thirds (59.1% or 88/149) of the residents who participated in the study were ex-smokers.

State of Oral Health

Dental Caries

As shown in **Table 1**, the decayed, missing and filled teeth (DMFT) score of the current study population was 24.86, compared with 25.53 in 1980. The average number of teeth present was 12.91 (SD 7.82) teeth, slightly higher than the 11.05 (SD 6.78) teeth found in institutionalized dentate persons in the 1980 study. The average number of decayed teeth fell from 2.43 (SD 2.88) in 1980 to 1.62 (SD 2.53) in 2004. A major reduction in the percentage of elderly people with decayed teeth occurred since 1980: in 2004, 49.3% (75/152) of elderly people had decayed teeth, compared with 74.1% in 1980.

Among those with diagnosed caries, about half required rapid treatment. Carious lesions of the enamel and arrested caries were not always identified as needing treatment when factors such as age, the ability to move about and the capacity to pay were taken into consideration. In elderly people with natural teeth, the average number of fillings free of dental caries improved considerably: from 2.15 (SD 3.89) teeth in 1980 to 4.14 (SD 5.15) in 2004.

Oral Hygiene and Periodontal Condition

Almost 90% (136/152) of the residents brushed their teeth daily; 68.5% (104/152) of the residents stated that no one helped them with this task. With some notable exceptions, debris and dental plaque were generally present. Data from the oral examinations revealed that over 90% (140/152) of people required instruction about oral hygiene and that 48.7% (74/152) had a periodontal condition (gingivitis, calculus, periodontal pocket) requiring scaling or surgical treatment.

Table 2 Perceived problems

Perceived needs ($n = 149$)	Number (%)
Experienced a problem, pain or discomfort with their teeth	
Yes	23 (15.4)
No	126 (84.6)
Experienced a problem, pain or discomfort with their gums	
Yes	5 (3.4)
No	144 (96.6)

Perceived and Diagnosed Needs

A major difference between perceived and diagnosed needs was found. Most residents did not believe that they needed oral health care (**Table 2**). From the results of the current study, elderly people's perception of their need for oral health care services had not changed over the previous quarter century. In 2004, 15.4% (23/149) of residents thought they had a tooth problem or pain, compared with 12.9% in 1980. Furthermore, only 3.4% (5/149) thought they had a problem, pain or discomfort with their gums, compared with 8.9% in 1980. At this level of periodontal treatment, the gap between the needs perceived by elderly people and the needs diagnosed during a clinical examination is the greatest. In fact, almost half (48.7% or 74/152) of these elderly people had a diagnosed need for periodontal treatment.

Access to Care

Since 1980, the use of dental services by elderly people with natural teeth who were residents of CHSLDs had improved. The time since the last visit for dental care was 7.1 years (SD 12.4) on average in 2004, compared with 11 years (SD 15.2) in 1980. In 2004, about two-thirds (63.8% or 83/130) of participants had recourse to dental care services in the last 5 years compared with 31% in 1980. In addition, 39.5% of institutionalized elderly people said that they would like to be seen by a dentist or a denturist (**Table 3**). The main reason they had not used oral health services for over 5 years was not economic, but an absence of perceived need for these services (**Table 3**).

Discussion

Three main conclusions can be drawn from the results of this study. The first is that institutionalized elderly people had more teeth and fewer untreated caries in the 2004 study³ than they did in the 1980 Quebec studies.^{1,2} However, despite a major reduction in the percentage of institutionalized elderly people with carious teeth in 2004, almost half of them had dental caries. This

Table 3 Use of services

Use	Number (%)
Last time dental services were used (n = 130)	
Less than 1 year	57 (43.8)
Between 1 and 4 years	26 (20.0)
5 or more years	47 (36.2)
Desire to be seen by a dentist or a denturist (n = 152)	
Yes	60 (39.5)
No	92 (60.5)
Reasons for not using oral health care services when no care had been received for 5 years (n = 59)	
No need	49 (83.1)
Economic reason	7 (11.9)

reduction and prevalence match those of other industrialized countries.⁴⁻⁷

The second conclusion is that institutionalized elderly people's perception of their need for oral health care services remained poor: it has not changed in the 25 years between the 2004³ and 1980^{1,2} studies. The attitude of the cohort of elderly participants in the 2004 study may account for this finding; they tended not to see oral health care as important.¹⁴⁻¹⁶ However, recent studies¹⁷⁻¹⁹ indicate that attitudes toward dentistry are changing. A more positive perception of dental care should be evident in the future because the next generations of elderly people will be more educated than previous generations.¹⁷⁻¹⁹ The oral health of this next generation should be better once they become elderly, and they will likely be more demanding about the maintenance and preservation of their natural teeth, which should be present in greater numbers.¹⁷⁻²⁰

The third conclusion to be drawn is that the situation is still not ideal, considering the numerous oral health problems diagnosed but untreated among institutionalized elderly people, despite their improved use of services since 1980. Their use of oral health care services has several distinctive features. For example, often their physical and cognitive abilities have changed; in addition, a new set of variables, such as their families, or the care staff or the administrators of the CHSLDs, may also influence the use of oral health care services.²¹⁻²⁴ As a result, the way elderly people perceive the state of their oral health must change. Preventative, curative and educational interventions will be needed to resolve their diagnostic issues and improve their use of dental services. Apart from this, the oral health care services provided by Quebec to institutionalized elderly people in CHSLDs are still meagre and

access remains limited, presenting considerable barriers to their use of the services.

Results of the current study are limited by its objectives, the population targeted and its methods. Nevertheless, because of the characteristics of the population and sociodemographic data of the participating regions, although not representative of the province, the oral health indicators used in this study provide a good snapshot of the oral health problems of elderly people losing their autonomy and residing in CHSLDs in Quebec. The regions selected for the study comprise about half the population of Quebec. In the Montréal region, because of its geography and diverse population, the health indicators are very similar to those for Quebec as a whole. In the Montreal region, the CHSLDs are medium or large in size. The centre in the Quebec City region is linked to a hospital specializing in geriatric care. The comparison of the results of this study with those of the 1980 studies of Brodeur and others,^{1,2} both of which involved similar elderly populations, allowed us to evaluate the changes in oral health in this sector of the population over the intervening 25 years.

Selection bias may also limit the conclusions drawn from this study. This bias can arise in studies of elderly people because of denial, misunderstanding or even disinterest in the research and can lead to systematic errors in the interpretation of the results.²⁵ In addition, elderly people with cognitive problems were excluded from this study. Yet CHSLDs in Quebec admit only elderly people with a serious loss of autonomy; depending on the institution, the rate of people affected by cognitive problems varies between 60% and 80%. Consequently, the selection of the sample focused on people in better physical and cognitive health who were capable of receiving oral health care treatment from dentists without too much difficulty.

Conclusions

This study shows that, given current resources, many minimal and easily achievable interventions could attenuate a good number of the gaps observed. On-site access to services is poor, and few CHSLDs receive regular visits from oral health professionals. Residents are little inclined to take the necessary steps to find services outside their institutions, because of their poor understanding of the role of these professionals who are not part of their normal environment. As a consequence, sensitizing institutionalized elderly people to, and educating them about, the importance of oral hygiene should be among the duties of the staff in these institutions, after appropriate training by oral health professionals in the provincial network of public health directorates. The training of physicians should also be improved. Given the need for simple treatments for institutionalized elderly people, it should be possible to introduce, at minimum, an annual

oral examination and a cleaning. Finally, financial accessibility to oral health care for institutionalized elderly people in CHSLDs should be facilitated through coverage for basic care under the public health insurance system, RAMQ.

In Quebec and in Canada, as in other industrialized countries, populations are aging and elderly people will soon represent a much greater proportion of the population. Because a large number of these people are preserving and keeping their teeth for longer periods of time, future elderly generations will have different needs than those of previous generations. This next generation will consider their oral health to be an important component of their quality of life. ❖

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References

1. Brodeur JM, Simard P, Kandelman D. Étude sur la santé buccodentaire des personnes de 65 ans et plus. Rapport final. GRIS. Université de Montréal; 1982.
2. Simard P, Brodeur JM, Kandelman D, Lepage Y. Dental needs of the elderly Quebecers. *J Dent Res* 1983; 62.
3. Corbeil P, Arpin S, Brodeur JM. Portrait de la santé buccodentaire des personnes âgées de 65 ans et plus hébergées en Centre d'hébergement de soins de longue durée en Montérégie, à Montréal et à Québec. *Journal dentaire du Québec* 2007; 44:119–28.
4. Hiidenkari T, Parvinen T, Helenius H. Edentulousness and its rehabilitation over a 10-year period in a Finnish urban area. *Community Dent Oral Epidemiol* 1997; 25(5):367–70.
5. World Health Organization. Global health data bank. WHO; Geneva: 2002.
6. Marcus SE, Drury TF, Brown LJ, Zion GR. Tooth retention and tooth loss in the permanent dentition of adults: United States, 1988-1991. *J Dent Res* 1996; 75 Spec No:684–95.
7. Steele JG, Treasure E, Pitts NB, Morris J, Bradnock G. Total tooth loss in the United Kingdom in 1998 and implications for the future. *Br Dent J* 2000; 189(11):598–603.

8. Stubbs C, Riordan PJ. Dental screening of older adults living in residential aged care facilities in Perth. *Aust Dent J* 2002; 47(4):321–6.
9. Peltola P, Vehkalahti MM, Wuolijoki-Saaristo K. Oral health and treatment needs of the long-term hospitalised elderly. *Gerodontology* 2004; 21(2):93–9.
10. Berkey D, Berg R. Geriatric oral health issues in the United States. *Int Dent J* 2001; 51(3 Suppl):254–64.
11. Simons D, Kidd EA, Beighton D. Oral health of elderly occupants in residential homes. *Lancet* 1999; 353(9166):1761.
12. Brodeur JM, Benigeri M, Naccache H, Olivier M, Payette M. Trends in the level of edentulism in Quebec between 1980 and 1993. *J Can Dent Assoc* 1996; 62(2):159–60, 162–6.
13. Brodeur JM, Payette M, Benigeri M, Olivier M, Chabot D Étude sur la santé buccodentaire des adultes de 18 ans et plus du Québec. Résultats de sondage. Direction de la santé publique de Montréal-Centre; 1995.
14. Ettinger RL. Cohort differences among aging populations: a challenge for the dental profession. *Spec Care Dentist* 1993; 13(1):19–26.
15. Hämäläinen P, Meurnen JH, Keskinen M, Heikkinen E. Changes in dental status over 10 years in 80-year-old people: a prospective cohort study. *Community Dent Oral Epidemiol* 2004; 32(5):374–84.
16. Lewis DW, Thompson GW. Alberta's universal dental plan for the elderly: differences in use over 6 years by two cohorts. *Am J Public Health* 1995; 85(10):1408–11.
17. Ettinger RL, Mulligan R. The future of dental care for the elderly population. *J Calif Dent Assoc* 1999; 27(9):687–92.
18. Ettinger RL. Attitudes and values concerning oral health and utilisation of services among the elderly. *Int Dent J* 1992; 42(5):373–84.
19. MacEntee M. A look at the (near) future based on the (recent) past — how our patients have changed and how they will change. *J Can Dent Assoc* 2005; 71(5):331. Available: <http://www.cda-adc.ca/jcda/vol-71/issue-5/331.html>
20. Hugoson A, Koch G, Göthberg C, Helkimo AN, Lundin SA, Norderyd O, and others. Oral health of individuals aged 3-80 years in Jönköping, Sweden during 30 years (1973-2003). I. Review of findings on dental care habits and knowledge of oral health. *Swed Dent J* 2005; 29(4):125–38.
21. Kiyak HA, Reichmuth M. Barriers to and enablers of older adults' use of dental services. *J Dent Educ* 2005; 69(9):975–86.
22. Lester V, Ashley FP, Gibbons DE. Reported dental attendance and perceived barriers to care in frail and functionally dependent older adults. *Br Dent J* 1998; 184(6):285–9.
23. Smith BJ, Shay K. What predicts oral health stability in a long-term care population? *Spec Care Dentist* 2005; 25(3):150–7.
24. Chung JP, Mojon P, Budtz-Jorgensen E. Dental care of elderly in nursing homes: perceptions of managers, nurses, and physicians. *Spec Care Dentist* 2000; 20(1):12–7.
25. Dartigues JF. [Methodological problems in clinical and epidemiological research on ageing]. *Rev Epidemiol Sante Publique* 2005; 53(3):243–9. French.
26. Cliche J, Rémillard MB. Un milieu de vie de qualité pour les personnes hébergées en CHSLD : orientation ministérielle. La direction des communications du Ministère de la santé et des services sociaux 2003; p. 24.