ORAL HEALTH STATUS OF ONTARIANS AGED TWELVE YEARS AND OVER

An Analysis of Data from the Ontario Health Survey 1990

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COMMUNITY DENTAL HEALTH SERVICES RESEARCH UNIT

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This report presents the results of the analysis of the Dental Section from the Ontario Health survey (OHS) 1990 database. It provides information on the oral health status of, and the use of dental health services by the general Ontario population aged 12 years and over with respect to age, gender, income status and dental insurance coverage. The data were analyzed at the provincial and regional levels.

STUDY RATIONALE AND RESEARCH OBJECTIVES

The OHS 1990 was designed to assess the health needs and the use of health services by the general Ontario population, as well as to collect data on fundamental risk factors and determinants of health among Ontario residents.

It provides a unique set of data on the oral health, and use of oral health services by general Ontario population aged 12 years and over.

Previous Community Dental Health Services Research Unit's (CDHSRU) reports, based on the OHS information, have focused on oral health status and use of dental services among Ontario adolescents and elderly Ontarians, differences in oral health and access to dental services of Ontarians by place of birth , and the relationship between oral health status and nutritional intake in Ontario adults aged 65 years and older.

The aim of the study on which this report is based was to determine the oral health status and use of dental services by Ontarians aged twelve years and over, with respect to age, gender, household income, dental insurance coverage and place of residence.

METHODOLOGY

The design and methodology of the OHS 1990, and the guidelines for the release of data are described in the documentation released by the Ontario Ministry of Health (Ontario Ministry of Health, Ontario Health Survey 1990. User's Guide Volume 1, Documentation, 1992). Details relevant to this report are also presented in previous CDHSRU reports.

The questions on oral health and use of dental services were included in the self-complete component of the questionnaire, with the exception of the frequency of dental visits in the previous year that was obtained as a proxy response in a personal interview.

All results presented in this report are population estimates and not sample statistics. The precision of these estimates was derived with reference to Tables of Approximate Coefficients of Variation presented in the Ontario Health Survey 1990, User's Guide Vol. Microdata Manual, Toronto, Ontario, 1992.

Findings that do not meet criteria for the release of data are omitted in this report. Whenever the coefficients of variation fall between 16.6% and 25%, the estimates are accompanied by asterisk (*) indicating high sampling variability.

STUDY VARIABLES

Measures of oral health

Estimates of the following oral health indicators were determined in this analysis: dental status, chewing ability and five common oral symptoms (spontaneous and stimulated dental pain, bleeding gums, pain in the temporomandibular joint and discomfort from dentures). These indicators reflect key components of the contemporary concept of oral health, and are broadly indicative of treatment needs.

Measures of utilization of dental services

The use of dental services was measured by the time since the last visit to a dental care provider and the number of dental visits in the last year. The main reasons for not visiting a dental care provider in the previous 12 months were also determined.

Demographic and socio-economic factors

The study explored the impact of age, sex, household income and dental insurance coverage on oral health status and dental services utilization in Ontario. The age of respondents was collapsed into four categories: 12-19, 20-44, 45-64, and 65 and above, to approximate the age breakdown used in the Mandatory Health Programs and Services Guidelines. The respondents were classified into three household income groups: low, medium and high. For the residents from urban communities, low income households were those with an annual income less than $12,000, regardless of the family size, those with an income between $12,000 and $19,999 and household size of 2 or more, and those with an income between $20,000

and $29,999 and household size of 4 or more. The cut off points were the same for the respondents from rural communities but the household size was different: 3 and 7, respectively. These criteria were established by the National Council of Welfare and Statistics Canada. Respondents who were not low income were further divided into medium and high income, according to whether their household income was above or below $50,000. This cut off approximates a below-average/above average split since the average household income in Ontario for 1989 was $50,588.

RESULTS

Oral Health

Prevalence of edentulism

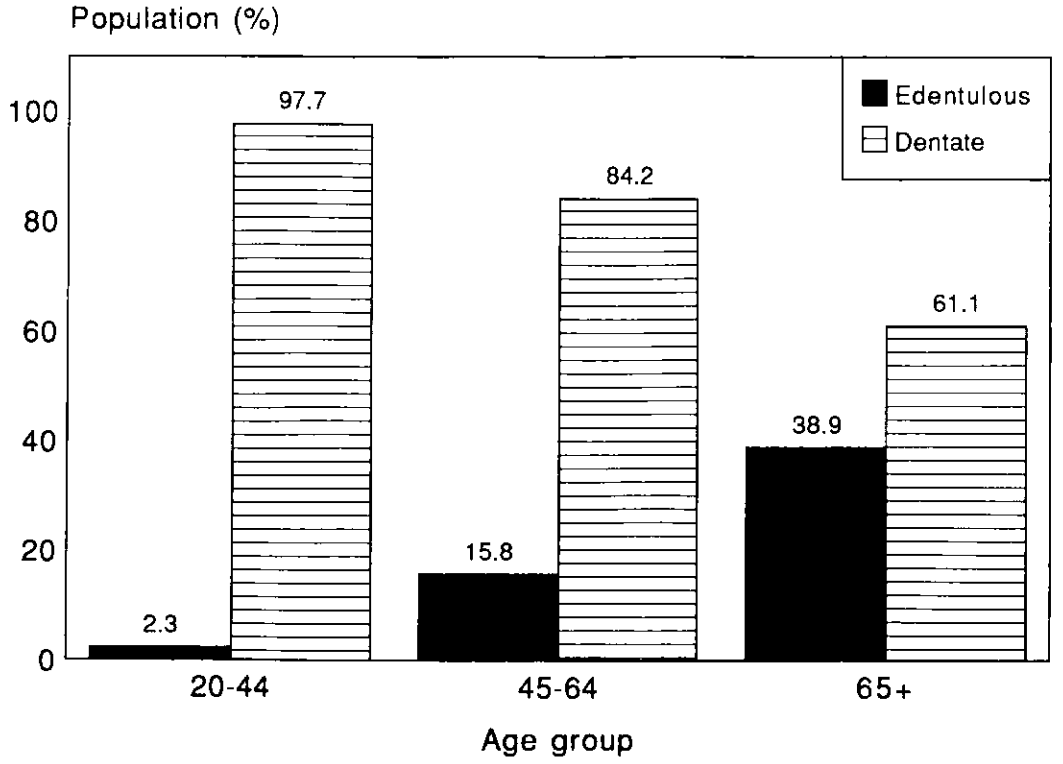
The prevalence of edentulism (loss of all natural teeth) is an important indicator of oral health and a significant predictor of the use of dental services.

Age and gender - Overall, 10.3% of Ontarians reported not having their own teeth. The rate increased substantially with age, from 2.3% in the age group 20-44 to 38.9% in the age group 65 and over (Figure 1). Gender differences were very small in each age group.

Income - The prevalence of edentulism was inversely related to household income (Figure 2). Ontarians with low incomes were four times more likely (22.3%) to be edentulous than those with high incomes (4.6%).

DENTAL STATUS BY AGE

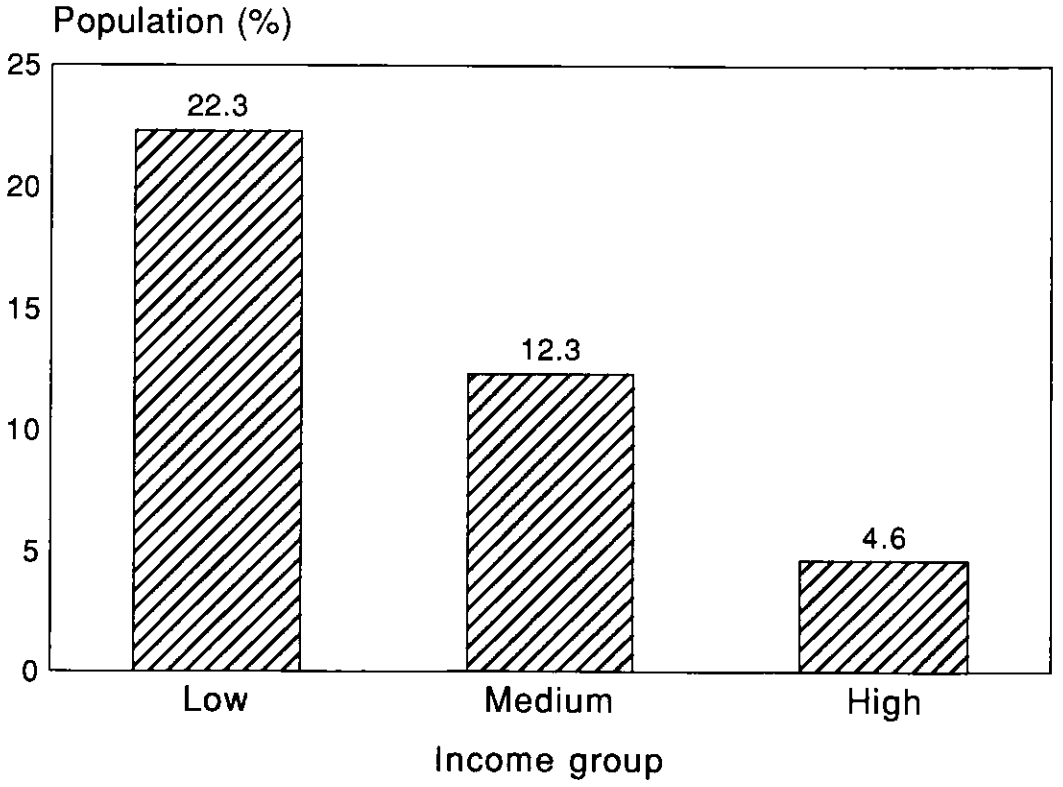
Figure 1



* Prevalence of edentulism not reportable for the age group 12-19

PREVALENCE OF EDENTULISM BY INCOME

Figure 2



Dental insurance - Ontarians who had dental insurance were substantially less likely to be edentulous (6.4%) than those without the coverage (17.4%). The excess prevalence among uninsured was observed in all income groups (Table 1).

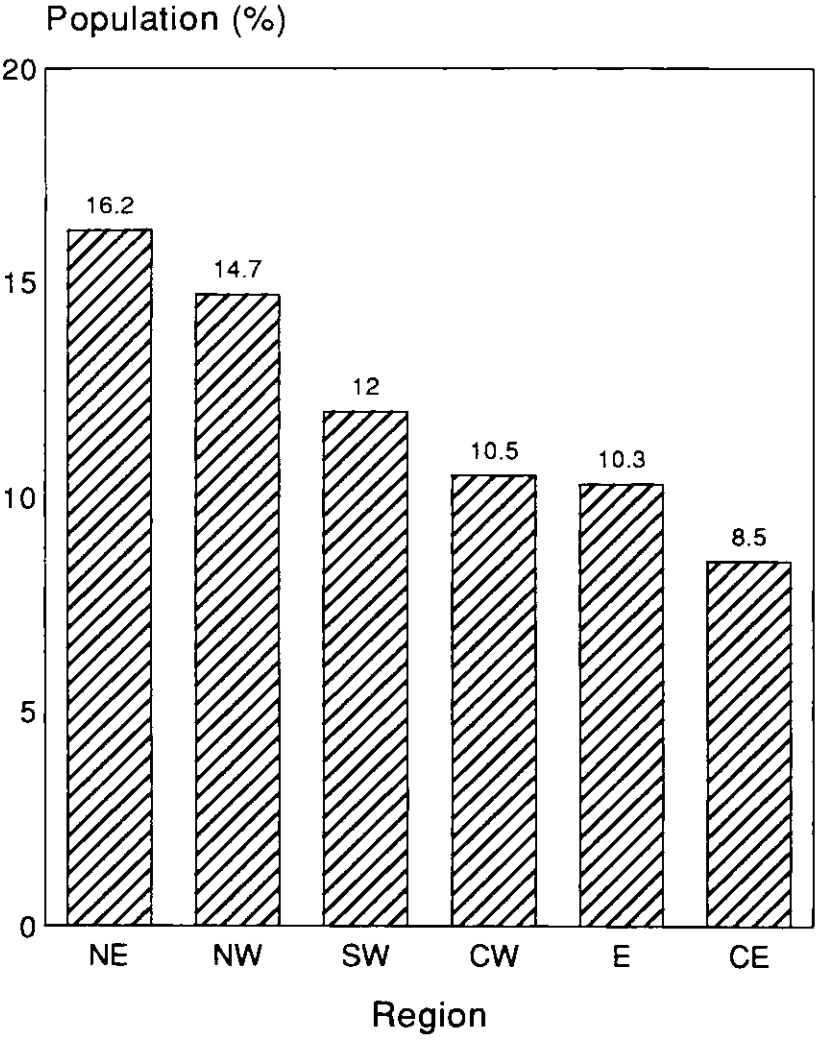
PREVALENCE OF EDENTULISM (%)
BY INCOME AND DENTAL INSURANCE

Income group	Dental insurance	
	Yes	No
Low	14.9	26.5
Medium	8.7	18.2
High	3.8	8.3

Table 1

Geographical location - The prevalence of edentulism was higher in rural (13.4%) than in urban communities (9.8%). It also varied by region, with the Central East region having the lowest (8.5%), and the North East (16.2%) and North West (14.7%) regions having the highest rates (Figure 3).

PREVALENCE OF EDENTULISM BY REGION
Figure 3



Denture status

Denture status refers to prosthetic replacement (dentures or bridges) of missing teeth.

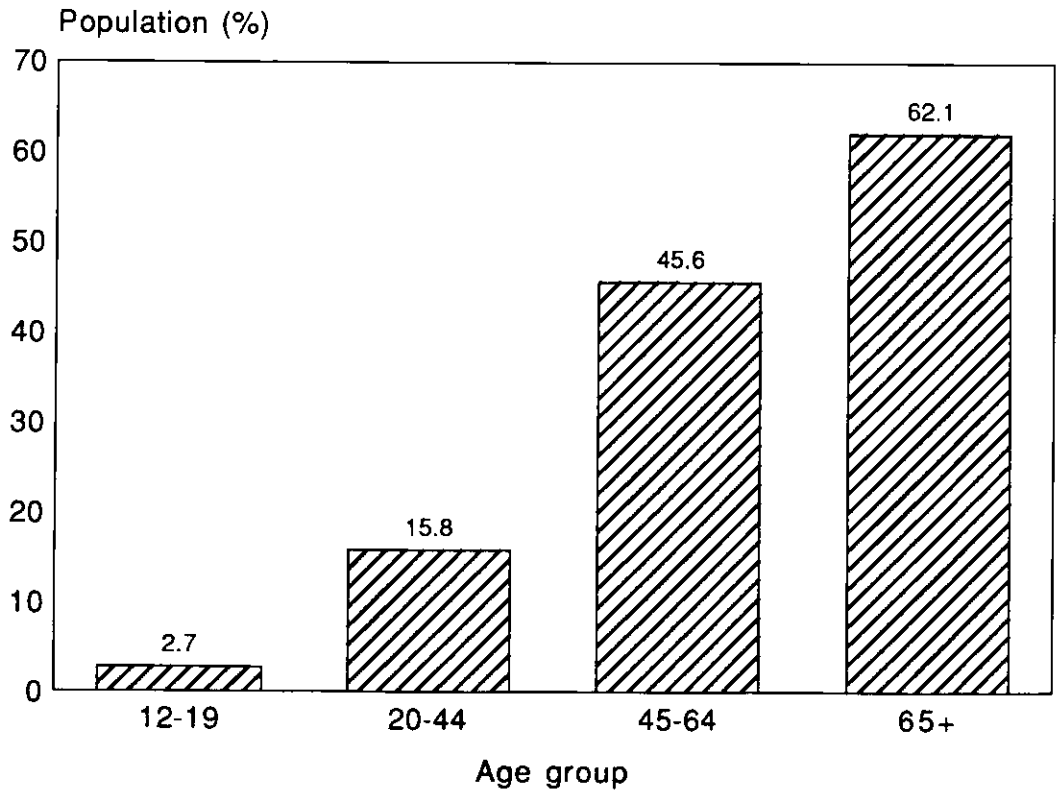
Dentate population

One quarter (24.9%) of dentate Ontarians reported that they wore either dentures or bridges.

Age and gender - The age-specific rates were very different (Figure 4). They varied from a low of 2.7% in the age group 12-19 to a high of 62.1% in the age group 65 and over. Gender differences were small irrespective of age.

DENTATE POPULATION WITH PROSTHETIC REPLACEMENTS

Figure 4



Income - Ontarians from low and medium income groups were equally likely to wear dentures or bridges: 28.1% and 27.5% respectively. The proportion of high income Ontarians wearing prostheses was lower: 21.9%.

Dental insurance - Ontarians who had dental coverage were less likely to have prosthetic replacements (22.8%) than those who did not have insurance (29.5%). In each income group the percent wearing dentures or bridges was lower among insured than uninsured persons (Table 2).

Dentate population with prosthetic replacements by income and dental insurance (%)

Income group	Dental insurance	
	Yes	No
Low	22.7	32.5
Medium	25.3	31.7
High	21.4	24.2

Table 2

Geographical location - The percentage of Ontarians from urban and rural communities who wore prosthetic replacements for missing teeth were similar. Regional differences were also very small.

Edentulous population

The overwhelming majority (94.5%) of edentulous Ontarians reported having dentures. Age and gender differences were small, as well as the differences between income groups, irrespective of dental insurance status. The rates were very similar across the province.

Chewing ability

The mastication of food is one of the main functions of the oral cavity. Therefore, the ability to chew is a key functional indicator of oral health status. In this analysis it was measured by a short form of the Index of Chewing Ability.

Respondents who were not able to bite or chew one or more of three foods: raw apple, raw carrot, firm meats, were defined as having a limitation in chewing capacity.

Chewing disability was ten times more often reported among edentulous (3.8%) than dentate (38.3%) Ontarians. It increased substantially with the age. In the age group 20-44 the rate of chewing disability was 2.0% among dentate and 28.6% among edentulous persons, while 13.3% of dentate and 42.7% of edentulous elderly Ontarians (65 years and over) reported having limited chewing capacity (Figure 5).

Gender differences were minimal, overall and in each age group, irrespective of dental status.

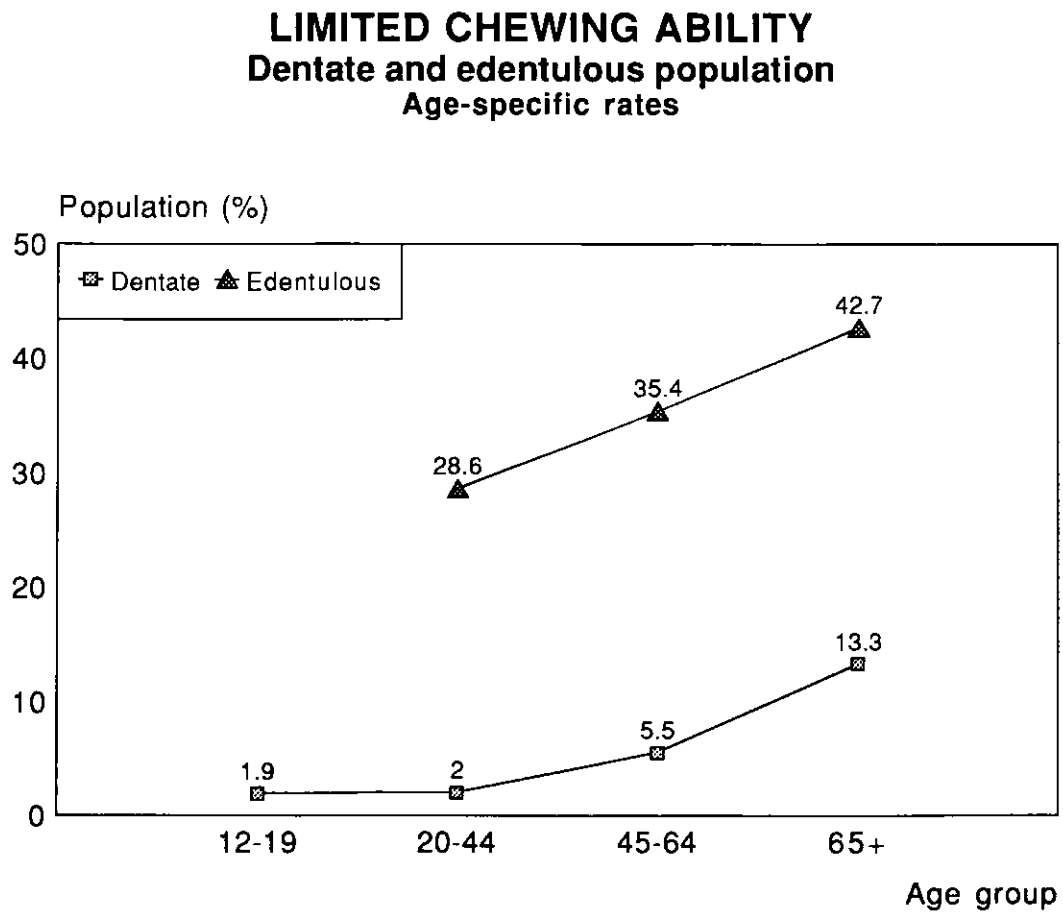


Figure 5

Oral symptoms

The OHS collected data on five oral symptoms: toothache, tooth sensitivity to cold, hot and sweet foods and liquids, sore or bleeding gums, pain in the jaw joints, and pain and discomfort associated with dentures. The reference period was the month before the completion of the questionnaire.

Dentate population

More than a third (36%) of dentate Ontarians reported having at least one of these five symptoms during the four weeks prior to survey. The majority of them (65.9%) experienced one, 24.9% two, 7.5% three and 2.3% four or five dental problems (Figure 6).

PERCENT WITH ONE OR MORE SYMPTOMS DURING FOUR WEEKS PRIOR TO SURVEY
Dentate population

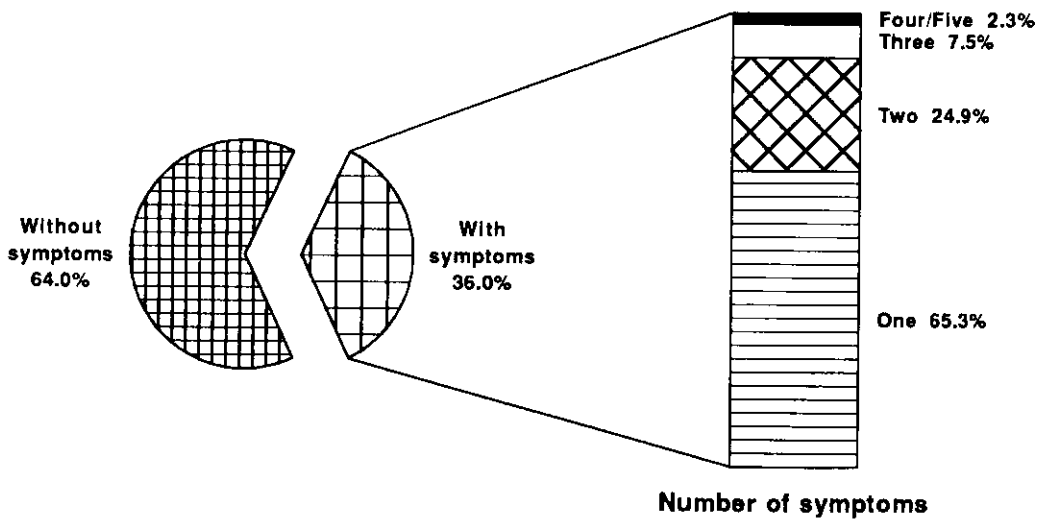


Figure 6

Income - Very similar percentages of people from low, medium and high income households experienced one or more of the above symptoms: 35.9%, 35.6% and 37.5% respectively.

Dental insurance - Ontarians who had dental insurance reported having oral problem(s) in the previous four weeks more often (37.6%) than those who were uninsured (34.2%). Low income people with dental insurance were the most likely to have one or more of the symptom(s) (Table 3).

Dentate population with at least one dental problem in the last four weeks by income and dental insurance (%)

Income group	Dental insurance	
	Yes	No
Low	40.3	33.2
Medium	37.1	32.7
High	37.5	37.6

Table 3

Geographical location - Regional differences and the difference between urban and rural communities were very small.

Tooth sensitivity to cold, hot and sweet was the most common oral symptom (26.6%), followed by toothache (14.3%) and gum problems (14.0%) (Table 4). Discomfort caused by dentures and pain in the jaw joints were less likely to be reported: 11.5% and 7.3%, respectively.

Prevalence of oral symptoms in the last four weeks

Oral Symptoms	Percent
Toothache	14.3
Tooth sensitivity to cold, hot,sweet foods and liquids	26.6
Sore or bleeding gums	14.0
Pain in the jaw joints	7.3
Denture problems	11.5

Table 4

Ontarians in the age groups 12-19 and 20-44 were more likely to have toothache, tooth sensitivity to cold, hot and sweet foods and liquids, problems with gums and pain in the jaw joints that the those in the age groups 45-64 and 65+ (Figure 7). The prevalence of discomfort caused by dentures was inversely related to the age, ranging from 13.1% in the age group 20-44 to 18.5% in the age group 65+ (Figure 7).

ORAL SYMPTOMS DURING FOUR WEEKS PRIOR TO SURVEY
Dentate population
Age-specific rates

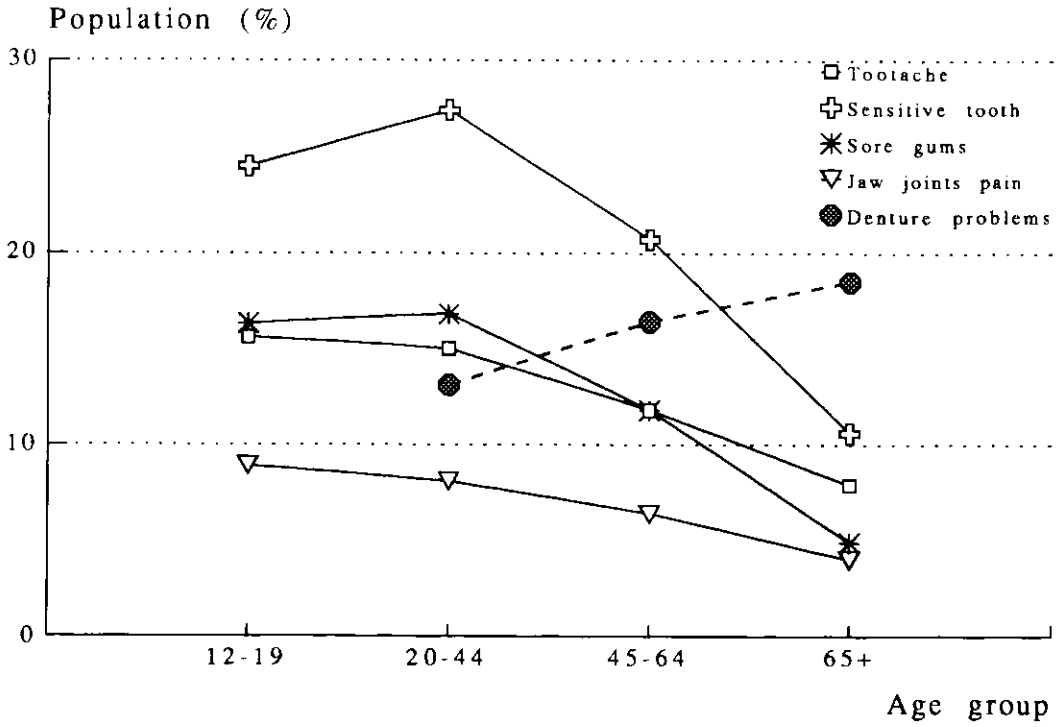


Figure 7

Edentulous population

One fifth (21.8%) of edentulous Ontario population reported having discomfort caused by dentures and/or pain in the jaw joints in the month prior to the survey.

Age - Younger edentulous people were more likely to have dental problem(s) than their older counterparts. The symptom prevalence rate declined from 27.2% in the age group 20-44 to 18.5% among the elderly people (65 years and over).

Income - The percent of low, medium and high income edentulous Ontarians reporting oral problem(s) in the previous month was very similar: 21.4%, 21.7% and 25.1% respectively.

Dental insurance - Edentulous Ontarians who had dental insurance were more likely (26.5%) to report symptom(s) than those without the coverage (19.5%). The symptom prevalence rate was higher among insured than uninsured people in each income group (Table 5).

Edentulous population with at least one dental problem in the last four weeks by income and dental insurance (%)

Income group	Dental insurance	
	Yes	No
Low	29.1	19.6
Medium	25.6	18.5
High	26.4	22.5

Table 5

Utilization of dental services

Time since last dental visit

Dentate population

The majority of dentate Ontarians (73.7%) had visited a dental care provider during the 12 months prior to survey, while 14.4% had not seen a dental care provider between one and two years, 6.9% between three and five years, and 4.9% for more than five years (Table 6). Gender differences were small.

Time since last dental visit to a dental care provider by dental status (%)

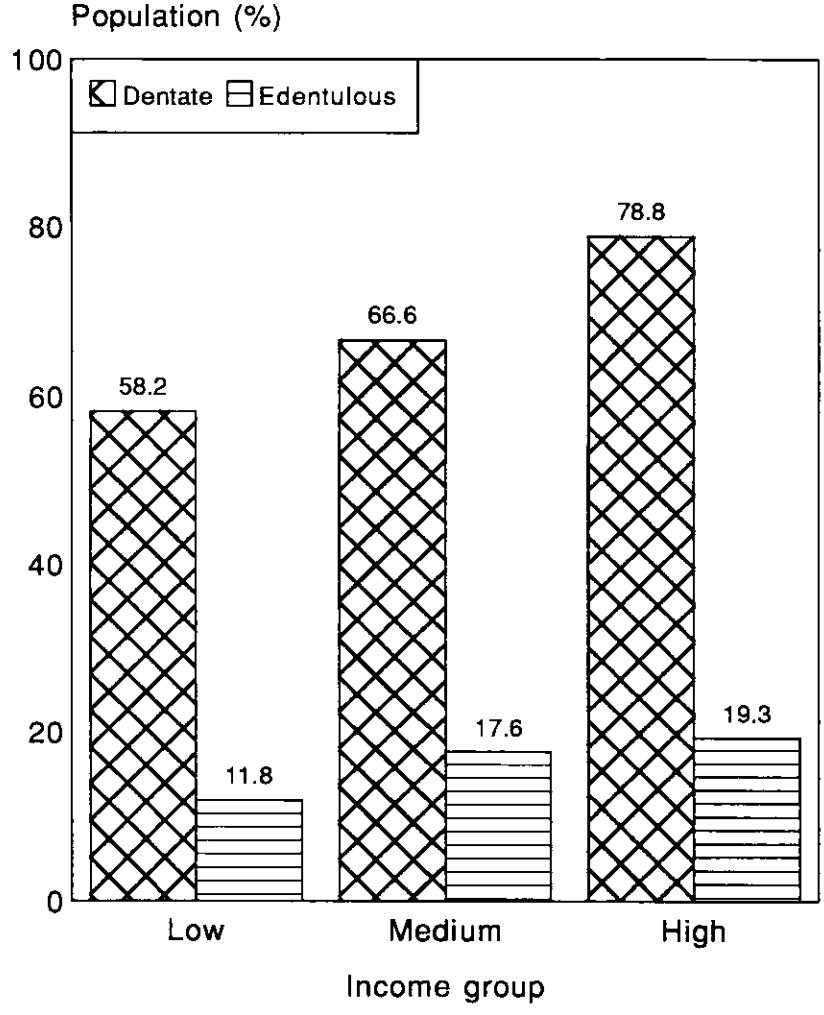
Number of years	Dentate	Edentulous
Last year	73.7	20.0
1-2 years	14.4	18.1
3-5 years	6.9	20.6
More than 5 years	4.9	43.1

Table 6

Income - People from low income households were less likely to make a dental visit in the previous year (58.2%) than those from medium (66.6%) and high income (78.8%) groups (Figure 8).

PERCENT REPORTING A DENTAL VISIT IN THE PREVIOUS YEAR BY INCOME

Figure 8



Dental insurance - Dentate persons who had dental insurance were substantially more likely to visit a dental care provider during the year prior to the survey (77.2%) than those who did not have dental coverage (60.2%). This relationship was observed in all income groups (Table 7).

Percent reporting a dental visit in the previous year by income and dental insurance

Income group	Dentate		Edentulous	
	Insured	Non-insured	Insured	Non-insured
Low	66.5	51.8	18.9	9.7
Medium	73.3	59.2	24.1	11.8
High	81.5	67.2	20.5	17.0

Table 7

Place of residence - Residents from urban communities were more likely to visit a dental care provider in the previous year (75.1%) than those from rural communities (69.5%). The rates were very similar across the regions of the province.

Among dentate Ontarians who had not visited a dental care provider in the last 12 months, two thirds (65.2%) reported making a dental visit only when needing dental treatment or advice. This was inversely related to income (Table 8).

Percent reporting a dental visit only when dental treatment or advice required among those who had not visited a dental care provider in the previous year

Income group	Dental status	
	Dentate	Edentulous
Low	75.3	95.4
Medium	67.5	91.6
High	57.4	85.9

Table 8

Edentulous population

Only one fifth (20.0%) of edentulous Ontarians had visited a dental care provider in the year prior to survey while as many as 41.3% have not made a dental visit for at least five years (Table 6).

Age - Elderly edentulous people (65 years and over) were less likely (15.8%) to see a dental care provider in the last 12 months than those in the age group 20-44 (26.3%) and the age group 45-64 (23.1%).

Income - The proportion of edentulous people who had visited a dental care provider in the previous 12 months was lower in the low income group (11.8%)) than in the medium (17.6%) and high (19.3%) income groups (Figure 8).

Dental insurance - Edentulous people who had dental insurance were almost two times more likely to make a dental visit in the last year (22%) than those without (11.9%). In each income group the proportion of those who had seen a dental care provider in the previous year was higher among insured than uninsured (Table 7). The rate ratio was the highest in the low income category (1.9), and the lowest in the high income category (1.2).

The overwhelming majority (91.1%) of edentulous people who reported not seeing a dentist for more than a year make a dental visit only when having a dental problem.

Frequency of visits in the previous year

Dentate population

Among dentate Ontarians who visited a dentist in the year prior to survey, the majority made one (33.9%) or two (46.6%) visits (Table 9).

Age, income, dental insurance coverage and regional differences were very small.

Frequency of dental visits in the last 12 months (%) among those visiting a dentist

Number of visits	Dentate	Edentulous
One	33.5	45.7
Two	46.5	21.4
Three	8.1	11.2
Four	5.1	4.9
Five or more	6.8	16.9

Table 9

Edentulous population

Among edentulous Ontarians who reported seeing a dental care provider in the previous year, 45.4% made one, 22% two, 11.2% three, 4.9% four, and 16.4% five or more visits (Table 9).

The small numbers did not allow the analysis of the effect of family income and

dental insurance on the frequency of dental visits.

Regional differences were minor, as well as the difference between rural and urban communities.

Mean reasons for not visiting a dental care provider in the previous year

Dentate population

The main reasons given by dentate Ontarians who had not seen a dental care provider in the previous year were that "nothing was wrong" (37.4%), cost of treatment (30.6%), fear of dental visit (14.0%) and lack of time (15.2%).

Low income people were two times more likely (46%) to cite cost as the reason for not visiting in the previous year than those in the high income group (20.1%). Similarly, the cost of a dental visit was reported as the reason for not making a dental visit in the previous year more often among those who did not have (48.4%) than among those who had dental insurance (17.6%).

Edentulous population

The majority of edentulous Ontarians (84.6%) cited a lack of perceived need as the reason for not seeing a dental care provider in the previous year. The second leading cause was the cost of dental visit (11.0%).

The proportion of respondents giving the cost of visit as a reason for not visiting a dental care provider was higher in the low (14.7%) than high income group (9.2%), as well as among people who did not have (13.4%) than among those who had dental insurance (7.7%).

DISCUSSION AND CONCLUSION

The OHS 1990 provides a unique set of information concerning the oral health status of, and the use of dental health services by the population of Ontario aged twelve years and over.

The aim of this study was to explore this database. Data were analyzed with respect to age, gender, household income, dental insurance coverage and geographic location, where appropriate and to the extent that sample size allowed, in order to explore their impact on the oral health and utilization of dental services.

The results provide evidence of considerable inequalities with regard to predictor variables. Low income people were five times more likely to lose all their natural teeth than people from a high income group. Those with dental insurance coverage were more likely to keep their teeth than respondents who did not have the coverage regardless of household income. Edentulism was the most prevalent among low income Ontarians without dental insurance. Residents from northern regions were almost two times more likely to be edentulous than central Ontario residents.

The proportion of the dentate population wearing a prosthesis increased substantially with the age of respondents. Low income people were also more likely to wore either dentures or bridges than the high income people. The data also suggested an inverse relationship between both income and dental insurance coverage, and the proportion of people wearing prosthesis.

In the four weeks prior to the survey, more than one third of dentate Ontarians experienced one or more of five oral symptoms. These problems were more common among older than younger respondents. Surprisingly, the rates were higher among people with than without dental insurance coverage.

The percentage of persons visiting a dental care provider in the previous 12 months was strongly inversely related to household income. Both dentate and edentulous Ontarians with dental insurance coverage were more likely to have a

dental visit in the last year than those without. The lowest rates were observed among low income residents without coverage. Central Ontario residents were the most, and people from northern regions the least likely to visit a dental care provider in the year prior to the survey.

Among those who have not seen a dental care provider for more than one year, more than two thirds make a dental visit only when experiencing pain or other problems. The percentage is inversely related to household income irrespective of dental insurance status.

The cost of dental visit was the most often cited reason for not visiting dental care provider. This barrier was reported by both insured and non-insured Ontarians. The relative importance of the cost was strongly inversely related to income status of respondents regardless of dental insurance coverage.

However, when interpreting the findings presented in this report, the limitations of the OHS data have to be considered.

The data collected in the OHS were self-reported since the study did not involve clinical examinations. Many studies have shown disagreement, low to moderate, between self-assessment and clinical diagnosis of dental status and presence of prosthesis, with tendency to overreport dental status and to underreport presence of removable dentures. Therefore, the estimates obtained from the OHS data do not have the level of accuracy as if they were based on clinical examination but still can be considered reasonably valid. The estimate of the proportion of Ontarians who needed prosthetic replacement for missing teeth might be less accurate than the measure of the prevalence of edentulism since some of the respondents who answered: 'Have own teeth and no dentures' to the question assessing dental status of dentate people, needed prostheses but did not have them.

Respondents who indicated that they had visited a dental care provider in the year prior to the survey were instructed not to answer the question pertaining regularity of dental visits. Therefore, the proportion of population seeing a dental care

providers regularly could have been approximated only as the percentage of the respondents who made a dental visit in the last 12 months. However, it includes an unknown proportion of those who use dental services sporadically or only when having pain or other problems.

Data on the number of dental visits in the previous year were obtained through the interviewer-completed questionnaire. As proxy responses these information are less accurate than if they were self-reported.

Oral disorders are only rarely life threatening. However, they can have a significant impact on the quality of life of individuals and their families because substantial disabilities and handicaps can result from poor oral health. Therefore, oral health and disease should be seen as an important public health issue.

This study suggests significant differences in the oral health and utilization of dental services by age, household income, dental insurance coverage and community of residence. These inequities should be addressed by the dental health professionals and health policy makers.