

**ORAL HEALTH STATUS OF ONTARIANS AGED FIFTY YEARS
AND OVER: CLINICAL ESTIMATES**

**An analysis of data from the
Ontario Health Survey 1990
and the
Ontario Study of the Oral Health of Older Adults**

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**COMMUNITY DENTAL HEALTH SERVICES RESEARCH UNIT
HEALTH MEASUREMENT AND EPIDEMIOLOGY
REPORT NO. 2**

1993

The Community Dental Health Services Research Unit (CDHSRU) is a joint project of the Faculty of Dentistry, University of Toronto and the Dental Division, North York Public Health Department. It is supported by a grant from the Ontario Ministry of Health.

The work on which this report is based was supported by an Ontario Ministry of Health information studies grant (#04128).

The opinions expressed in the report are those of the authors and no official endorsement by the Ontario Ministry of Health is intended or should be inferred.

In the CDHSRU Report No. 1 (1), data from the Ontario Health Survey 1990 were used to describe the oral health status and use of dental services by Ontarians aged 50 years and over. Because no clinical examinations were undertaken during the Ontario Health Survey all data on oral health were based on self-reports.

This report uses data from the Ontario Health Survey 1990 and the Ontario Study of the Oral Health of Older Adults (OSOHOA) to estimate the clinical oral health status and treatment needs of persons aged 50 years and over at the provincial and regional levels. Because the Ontario Study of the Oral Health of Older Adults (OSOHOA) was confined to four communities, data from that study were adjusted to the characteristics of the provincial population based on findings from the Ontario Health Survey 1990.

The Ontario Health Survey 1990

The Ontario Health Survey 1990 was conducted in response to the need for more complete information on the health status and needs of Ontarians. It aimed to provide planning data for each of the 42 Public Health Units and 28 District Health Councils across Ontario.

The target population for the survey was all Ontarians living in private households during 1990. People living in institutions, First Nations people living on reserves and residents of extremely remote areas were excluded. Data were collected by a personal interview conducted with one member of the household able to give information for all members of the household and a self-administered questionnaire

completed by each person in the household aged 12 years and over. The majority of the questions on oral health and use of dental services were included on the self-complete component of the survey.

The response rate to the surveys was high and data were obtained from 8837 people aged 50 to 64 years and 7112 people aged 65 years and over. This means that information on their oral health and use of dental services have a high degree of accuracy.

All data from the survey were weighted to the characteristics of the provincial population and represent population estimates and not sample statistics.

The Ontario Study of the Oral Health of Older Adults

The target population for this study was all persons aged 50 years and over living in private households in four communities in Ontario. These were the City of Toronto, the City of North York, Simcoe County and Sudbury and District. The study consisted of an initial telephone survey with a personal interview and clinical examination follow-up.

Study subjects were identified by means of a telephone survey based on random digit dialling. Computer generated telephone numbers were called and a randomization procedure used to select individuals from all households identified which contained one or more persons in the target age range. After completing a 39-item questionnaire, subjects were invited to participate in the personal interview and clinical examination phase. The interview and examination were conducted in the

subject's own home or at a public health department dental clinic according to personal preference.

The initial telephone administered questionnaire was used to collect data on sociodemographic characteristics, self-reported oral and general health status and use of dental services. The personal interview collected more detailed information on these topics including additional self-reported indicators of oral health. The clinical examination was based on methods recommended by the WHO. The examinations were undertaken by trained and standardized dentists and dental hygienists assisted by interviewer-recorders. The clinical data collected included prosthetic status; missing teeth; number of functional units; disorders of mucosa, teeth and bone; periodontal status using the CPITN and measures of attachment loss at two sites on each remaining tooth; gingival recession on all four tooth surfaces and coronal and root caries by tooth surface. All dentures and bridges were assessed for material defects, retention/stability (where applicable) and defects in occlusion. Treatment needs for all oral conditions observed were recorded. The clinical examination phase of the study was completed by 907 subjects from the four survey communities. Estimates of clinical indicators and treatment needs for subjects aged 50 to 64 years and 65 years and over are given in Table 1. More detailed information on study methods and results is to be found in Locker et al. (2-6).

The study reported here had two aims:

- 1) to compare the characteristics of independently-living Ontarians aged 50 years and over with those of the 907 subjects completing the personal interview and clinical examination phase of the OSOHOA;

- 2) to develop provincial and regional estimates of clinical oral health indicators by adjusting OSOHOA findings to the characteristics of the population of Ontario and its six regions.

Comparison of OSOHOA subjects and the provincial population

Table 2 compares the characteristics of the 907 subjects from whom clinical examination data were collected with the characteristics of the provincial population. The latter were derived from weighted Ontario Health Survey estimates. The populations were compared on 13 variables describing their sociodemographic, oral and general health status and use of dental services for two age groups, 50 to 64 years and 65 years and over.

Because of the large sample sizes, statistical tests to identify differences in distributions were meaningless. Consequently, the populations were deemed to differ on variables where the percent falling into any category differed by five percent or more.

When compared with the provincial population, OSOHOA subjects aged 50 to 64 years were less likely to be married, more likely to have education beyond high school, more likely to live in households with incomes of less than \$40,000 per year and less likely to be employed. They were more likely to report one or more chronic medical conditions, less likely to report their general health status as being good and less likely to have dental insurance coverage. Subjects aged 65 years and over were also less likely to be married, more likely to have higher education and more likely to live in low income households than their provincial counterparts. They were more likely to report one or more chronic medical conditions, less likely to be edentulous,

more likely to report one or more oral pain symptoms in the previous four weeks and more likely to have visited a dental care provider in the previous year.

Overall, both age groups differed from the provincial population of the same age on seven of the thirteen variables examined, although the magnitude of the difference was only marginally more than five percent for some. These variables were used to adjust clinical estimates derived from the examination component of the OSOHOA to provide estimates at the level of the province and its six regions. Estimates were not produced at the level of Public Health Units because of problems relating to sample size and confidence intervals.

Provincial level estimates

Adjusted estimates were calculated for the eleven clinical variables listed in Table 1. These were selected as those most relevant for program planning.

Adjusting the data was a two stage process. First, data from the OSOHOA was analyzed for associations between the eleven clinical variables and the seven variables on which OSOHOA subjects and the provincial population differed. Separate analyses were undertaken for those aged 50-64 years and those aged 65 years and over. Second, the category-specific means and proportions were applied to the estimated numbers of Ontarians with those characteristics and an adjusted estimate calculated. For each age group, an adjusted estimate was obtained based on each of the seven variables for which study subjects and the Ontario population differed. The mathematical calculations involved are simple though difficult to

describe. It should be noted that the adjustment process assumes that OSOHOA subjects and Ontarians similar in terms of their sociodemographic and other characteristics will also be similar in terms of clinical oral health status. It should also be noted that the magnitude of the differences between the estimates derived from the OSOHOA and the adjusted estimates will depend upon the magnitude of the differences between OSOHOA subjects and the provincial population and the strength of the association between the clinical parameters and the seven variables used in the adjustment process.

Table 3 gives the upper and lower end of the range of adjusted estimates at the level of the provincial population.

The ranges of adjusted estimates are narrow for most of the clinical variables examined and are narrower for those aged 50-64 years than those aged 65 years and over.

Regional level estimates

At the regional level adjusted estimates were calculated for the five variables describing needs for dental treatment. For those aged 50 to 64 years, educational status and household income were used as a basis for obtaining the adjusted estimates while educational status, household income and dental status were used for those aged 65 years and over. These variables produced the extremes of the ranges of the estimates at the provincial level. Table 4 gives their distributions for the six regions of the province. Table 5 gives the range of adjusted estimates of

treatment needs for these six regions.

The ranges of estimates at the regional level are wider than those at the provincial level for most regions and are wider for the older compared to the younger aged group. This reflects the extent of the differences between OSOHOA subjects and the regional populations.

DISCUSSION

Because no oral examinations were undertaken as part of the Ontario Health Survey 1990, information on the clinical oral health status of older Ontarians was not available. This report has estimated these clinical characteristics at the provincial and regional levels using data collected as part of the Ontario Study of the Oral Health Status of Older Adults.

The estimates in the report were derived using an adjustment process identical to that used in adjusting for non-response. As noted earlier in the report, this procedure is based upon a number of assumptions. Consequently, the estimates should be treated with due caution.

Unfortunately, sample size considerations prevented the generation of estimates at the PHU level. Since there is likely to be significant variation across PHU's, as revealed in the analysis of data from the Ontario Health Survey 1990 (see CDHSRU Report No. 1), additional caution is required when using provincial or regional estimates to estimate need within PHU's.

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TABLE 1

ONTARIO STUDY OF THE ORAL HEALTH OF OLDER ADULTS:
CLINICAL VARIABLES BY AGE GROUP

Age:	50-64 years (n=512)	65 years & over (n=395)
Mean # of missing teeth	11.0	15.7
% with 1+ decayed crown surfaces	30.6	24.2
Mean # decayed crown surfaces	0.69	0.57
% with 1+ decayed root surfaces	19.7	23.4
Mean # decayed root surfaces	0.49	0.63
% with periodontal pockets 6mm or more	9.8	6.3
Treatment needs (%):		
Restorative	39.0	34.3
Prosthetic	47.5	52.2
Extractions	6.5	4.9
Immediate*	7.7	5.9
Periodontal**	34.0	23.0

* Requiring urgent treatment for relief of current or future pain or infection.

** Periodontal treatment beyond prophylaxis and oral hygiene instruction (CPITN categories 3 and 4).

TABLE 2
 CHARACTERISTICS OF POPULATION OF ONTARIO
 AND
 OSOHOA SUBJECTS BY AGE GROUP
 (%)

Age:	50-64 years		65 years & over	
	Ontario	OSOHOA	Ontario	OSOHOA
Gender:				
Male	49.6	47.4	41.3	37.8
Female	50.4	52.6	58.7	62.2
Marital Status:				
Married	84.8	60.5	62.5	41.8
Single	4.0	9.9	4.8	9.5
Widowed	5.5	10.9	27.9	40.5
Sep/Div.	5.6	18.7	4.8	8.2
Educational Status:				
Primary	21.2	15.1	30.2	16.8
Secondary	50.3	44.3	48.2	52.1
Trade/CAAT	13.5	9.7	11.3	9.1
University	14.9	30.8	10.3	22.0
Household Income:				
<\$20,000	12.0	26.3	40.9	55.3
\$20-39,000	27.0	32.2	34.5	28.5
\$40-59,000	25.4	21.2	14.7	10.3
\$60-79,000	16.8	9.1	4.7	3.8
\$80,000 or more	18.8	11.2	5.2	2.1
Place of Birth:				
Canada	62.7	63.7	66.5	65.5
Other	37.3	36.3	33.5	34.5

TABLE 2 cont'd

Age:	50-64 years		65 years & over	
	Ontario	OSOHOA	Ontario	OSOHOA
Employment Status:				
Not employed	32.7	38.3	89.8	88.1
Employed	67.3	61.7	10.2	11.9
Self-rated General Health:				
Excellent	17.1	19.5	12.0	14.8
Very good	36.8	30.7	30.3	25.7
Good	30.3	31.7	34.6	34.7
Fair	11.8	14.7	19.0	19.5
Poor	4.0	3.4	4.2	5.5
Chronic Medical Conditions:				
None	57.0	41.2	36.1	25.2
One or more	43.0	58.8	63.9	74.8
Dental Status:				
Dentate	81.4	83.1	61.1	71.2
Edentulous	18.6	16.9	38.9	28.8
Difficulty Chewing:				
No	85.9	83.5	73.2	71.0
Yes	14.1	16.5	26.8	29.0
Oral Pain Symptoms in Prior 4 Weeks:				
No	69.7	65.3	78.8	64.2
Yes	30.3	34.7	21.2	35.8

TABLE 2 cont'd

Age:	50-64 years		65 years & over	
	Ontario	OSOHOA	Ontario	OSOHOA
One or More Dental Visits in Previous Year:				
Yes	66.3	67.8	54.6	62.1
No	33.7	32.2	45.4	37.9
Dental Insurance Coverage:				
Yes	66.9	59.8	29.3	29.0
No	33.1	40.2	70.7	71.0

TABLE 3

RANGE OF ADJUSTED ESTIMATES:
PROVINCE OF ONTARIO

Age:	50-64 years (n=1,367,868)	65 years & over (n=1,136,681)
Mean number of missing teeth	9.7-12.5	14.6-17.6
% with 1+ decayed crown surfaces	29.7-29.9	20.9-28.8
Mean number decayed crown surfaces	0.67-0.70	0.49-0.66
% with 1+ decayed root surfaces	18.7-20.9	20.2-25.4
Mean number decayed root surfaces	0.47-0.53	0.54-0.73
% with periodontal pockets 6mm or more	8.1-10.3	5.5-8.4
Treatment needs (%):		
Restorative	37.8-40.3	28.6-36.2
Prosthodontic	41.5-53.1	48.3-56.8
Extractions	4.6-7.1	3.4-5.4
Immediate	6.3-8.8	5.6-6.4
Periodontal	33.3-35.5	19.5-26.4

TABLE 4
CHARACTERISTICS OF REGIONAL POPULATIONS
(%)

Region:	SW	CW	CE	E	NE	NW
<u>Age 50-64 years</u>						
Educational Status:						
Primary	19.0	21.4	22.2	15.8	29.6	17.7
Secondary	56.4	52.6	47.0	52.1	48.8	54.5
Technical College/CAAT	14.5	12.3	13.7	15.1	11.6	12.5
University	10.0	13.7	17.2	17.0	10.0	15.3
Household Income:						
<\$20,000	4.0	4.3	4.3	6.1	8.6	5.0
\$20-39,000	36.3	25.6	24.7	23.7	33.8	30.1
\$40-59,000	31.6	27.8	22.2	24.2	27.9	31.1
\$60-79,000	19.3	25.0	23.4	29.8	23.3	21.7
\$80,000 or more	8.8	17.3	25.3	16.2	6.3	12.1
<u>Age 65 Years and Over</u>						
Educational Status:						
Primary	30.0	31.8	27.9	27.0	45.4	37.2
Secondary	51.1	50.0	49.0	44.3	39.4	44.9
Trade School/CAAT	13.3	9.6	11.2	13.2	9.3	8.9
University	5.6	8.5	11.9	15.5	6.0	9.0

TABLE 4 cont'd

Region:	SW	CW	CE	E	NE	NW
<u>Age 65 years and over</u>						
Household Income:						
<\$20,000	14.7	17.0	15.2	14.8	22.6	15.0
\$20-39,000	44.2	31.9	32.6	32.8	32.7	42.0
\$40-59,000	15.1	12.8	14.7	20.5	7.8	8.8
\$60-79,000	25.4	34.0	29.0	28.3	35.0	31.0
\$80,000 or more	0.5	4.4	8.6	3.5	1.9	3.2
Dental Status:						
Dentate	59.1	58.9	64.9	62.8	47.3	50.7
Edentulous	40.9	41.1	35.1	37.2	52.7	49.3

TABLE 5

RANGE OF ADJUSTED ESTIMATES OF TREATMENT NEEDS:
BY REGION AND AGE GROUP
(%)

	50-64 years	65 years and over
<u>South West</u>		
Restorative	36.2-40.8	27.6-40.2
Prosthodontic	41.9-53.5	40.8-57.8
Extractions	4.2-7.4	2.7-4.9
Immediate	6.4-8.9	4.4-6.6
Periodontal	32.0-35.4	18.9-33.6
<u>Central West</u>		
Restorative	37.4-40.1	27.6-40.3
Prosthodontic	38.1-53.7	40.1-57.6
Extractions	3.6-7.2	2.3-5.1
Immediate	5.5-8.9	3.8-6.7
Periodontal	33.8-35.2	18.8-36.1
<u>Central East</u>		
Restorative	37.2-39.5	30.4-42.0
Prosthodontic	37.0-52.6	39.8-56.1
Extractions	3.5-7.0	2.5-5.0
Immediate	5.3-8.7	3.7-5.6
Periodontal	32.7-35.0	20.7-35.4

TABLE 5 cont'd

	50-64 years	65 years and over
<u>East</u>		
Restorative	38.2-40.8	29.5-41.4
Prosthodontic	37.5-51.1	39.9-55.0
Extractions	3.5-7.1	2.6-4.8
Immediate	5.5-8.4	3.9-6.1
Periodontal	35.1-35.3	20.1-35.8
<u>North East</u>		
Restorative	36.0-41.5	22.2-38.2
Prosthodontic	42.2-56.8	41.7-60.1
Extractions	4.4-7.1	2.8-5.1
Immediate	6.6-9.6	4.2-6.8
Periodontal	33.8-35.3	15.1-35.0
<u>Northwest</u>		
Restorative	23.8-40.4	30.5-40.1
Prosthodontic	40.4-54.4	40.4-61.9
Extractions	3.9-7.2	2.5-5.2
Immediate	6.0-8.7	4.1-6.6
Periodontal	28.3-35.2	16.2-34.5