THE ORAL HEALTH OF GRADE 8 STUDENTS IN NORTH YORK:

A comparison between Canadian-born and immigrant adolescents.

Martha Clarke, David Locker, Aleksandra Jokovic

COMMUNITY DENTAL HEALTH SERVICES RESEARCH UNIT

HEALTH MEASUREMENT AND EPIDEMIOLOGY
REPORT NO. 12

1996

The Community Dental Health Services Research Unit is a joint project of the Faculty of Dentistry, University of Toronto and the Community Dental Services Division, North York Public Health Department. It is a Health Systems-Linked Research Unit funded by the Ontario Ministry of Health (Grant #04170).

Much is known about the oral health status of elementary school children in Ontario. Over time, there has been a decrease in the rates of dental disease for children[1] which can be attributed in part to dental public health programs that provide screening, referral, and in some communities, dental treatment. In addition, the Ontario Ministry of Health's "Children In Need Of Treatment" (CINOT) program provides care for children up to Grade 8 who are in urgent need of treatment whose parents declare a financial hardship.

The City of North York is an example of a community that addresses the oral health needs of elementary school children. The Community Dental Services Division of The City of North York Public Health Department has many programs, among which are targeted screening, referrals and preventive care for all students from Junior Kindergarten (JK) through Grade 8 (up to age 15). A school-based dental treatment program is offered to students from JK through Grade 6. In addition, eligible students from JK through Grade 8 can receive treatment through the Ministry of Health's CINOT program. Currently, no programs address the oral health needs of children beyond Grade 8.

Despite the improvement in oral health among elementary school children, data show that dental disease is concentrated in high risk groups such as recent immigrant populations[1]. Studies have concluded that the oral health of immigrants is poor and that they have low rates of use of dental services[2-6].

While Canadian data on the oral health of immigrants is sparse and is limited to children, the data suggest that there are inequalities between non-immigrants and

immigrants. A 1985 study compared Canadian born and immigrant five-year-olds in Toronto and found that the immigrant children had twice the **def** rates of the non-immigrants[7].

There is a suggestion that the inequities and inequalities in oral health among adolescents become more marked once eligibility for dental public health programs ceases. Data to support this come from the 1990 Ontario Health Survey[8] that found that older adolescents aged 18 and over had higher rates of subjectively reported dental disease as well as less frequent dental visits than younger teens. Moreover, the CDHSRU's recent study on the oral health of disadvantaged adolescents[9,10] in North York found that groups such as the underhoused or recently immigrated teens aged 14 to 20 had high rates of oral disease, many treatment needs and a low frequency of dental visits.

Dental public health programs aim to reduce these inequities and inequalities. To use resources most efficiently, it is important to identify the groups most in need and then to direct programs to them. This study measures the oral health status of Grade 8 students in North York schools. The study has two objectives. The first objective is to measure and describe the oral health status of Grade 8 students as a baseline for a longitudinal study of adolescent oral health. As Grade 8 students are the last age group eligible for dental public health programs, a comparison of data for this cohort in three years should demonstrate if there is a deterioration in oral health once eligibility for dental public health programs ceases.

The second objective of this study is to measure the oral health status and treatment needs of Grade 8 students in order to determine if there are differences between immigrant and non-immigrant students. Comparisons between the two groups will address the hypotheses that: a) dental disease is concentrated in a minority of the population; and that b) this concentration is in the immigrant population.

There are two reasons to compare non-immigrant and immigrant populations in North York. First, there is a high proportion of immigrants in the North York population. The 1991 Census data show nearly 50% of the residents of The City of North York report their place of birth as outside of Canada[11]. In addition, since 1986, there has been an increase in the number of immigrants to North York that has resulted in a change to the multicultural profile of the city[11]. These changes can have implications for health status and subsequent program delivery.

METHODS

Sampling frame and subject selection:

The target population was all Grade 8 students attending North York public and separate schools. A random sample was selected from a list of 104 schools that had classes for Grade 8 students. In all, 26 schools with a total of 2100 students were selected. Some schools were not targeted for an annual dental screening because they were designated as 'low risk' for dental disease. When these schools were excluded, the list was reduced to 18 medium to high risk schools.

Study design:

The survey was conducted as part of the existing mandatory dental screening program of the Community Dental Services Division of North York Public Health Department. Students receive an annual dental screening and are referred for treatment as necessary. The dental screening program is non-invasive and parental consents were not required. Students were excluded only if parents had formally declared that their children could not participate in North York Public Health Department dental programs.

All Grade 8 students at the selected schools participated in the survey. Data were collected by means of a self-complete questionnaire and a clinical examination. The questionnaire was designed to collect data on self-reported dental problems, use of dental services, last time at the dentist, and dental insurance coverage. The dental

examination measured oral hygiene status with a debris index[12] and a calculus index[12]. Periodontal health was measured with the Community Periodontal Index of Treatment Needs (CPITN)[13]. Caries experience was measured in terms of the number of decayed, missing, and filled teeth (DMFT). A summary of treatment needs was completed during the clinical examination where examiners noted the need for restorations, periodontal scaling, and extractions. In addition, urgent conditions were identified as those that were painful or likely to cause pain or infection in the future.

After the random selection of schools, principals were contacted by telephone to arrange convenient times to conduct the survey. Due to scheduling difficulties, some principals refused permission to conduct the survey at their schools. In all, fifteen schools were surveyed.

The survey was conducted at the schools by two experienced and calibrated dental hygienists in space provided by the institutions. The Grade 8 students were surveyed, class by class, until all subjects had been seen. Students who had difficulty answering the questionnaire were assisted by the examiners.

Data were analysed for the group of Grade 8 students as a whole, and according to years in the country since immigration. Data for immigrants were divided into three groups: i) those who immigrated to Canada within the preceding two years; ii) those who immigrated between three and five years ago; and iii) those who immigrated six or more years ago. Statistical tests involved these three subgroups and the Canadian-born students.

RESULTS

Table I depicts the characteristics of the study subjects. In all, 15 schools were visited and 721 of a potential 824 students participated in the survey giving a response rate of 87.5%. There were slightly more males than females in the sample. While 55.1% of the students were Canadian born, more than one-eighth, 13.3%, were recent immigrants, having come to Canada within the preceding two years. In addition, 14.4% had immigrated between three and five years ago.

Table II summarizes the utilization of dental services for the students. The majority of students had seen a dentist on regular basis. Nearly two-thirds (61.5%) reported visiting a dentist regularly and nearly three quarters (73.0%) had seen a dentist within the preceding twelve months. The Canadian-born students had the highest rates of regular dental visits with 76.2% having regular dental care and 81.7% visiting the dentist in the last year. In contrast, the most recent immigrants reported less frequent use of dental services with only 28.9% having regular dental visits and 56.3% having visited a dentist in the preceding twelve months.

ORAL HEALTH STATUS:

Oral health status was measured in terms of subjectively reported symptoms and clinical criteria.

Self-reported indicators of oral health: Table III depicts the students' experience with symptoms of oral disease in the preceding four weeks. Overall, one-fifth of the students reported bleeding gums and one-eighth reported toothache. There were no significant differences in the reported symptoms according to years since immigration.

Clinical indicators of oral health status: Table IV summarizes the prevalence of debris and calculus and the mean scores for the oral hygiene indices. Overall, 22.3% of the subjects had debris and 56.7% had calculus on at least one of the six indicator teeth. Mean scores for debris and calculus were highest in the immigrant population with the highest scores found in the group who had most recently immigrated. Moreover, nearly one-third (32.2%) of the recent immigrants had debris and 80.2% had calculus deposits. Less than one-fifth of the Canadian-born students had debris and 44.6% had calculus. This group also had the lowest mean scores for debris and calculus (t-test, $p<0.01$).

The summary of periodontal treatment needs (Table V) shows that, overall, less than one-third of the students were considered periodontally healthy. Canadian-born students had better overall periodontal health with a higher percentage with low

CPITN scores (t-test <0.01). Immigrant students had the highest incidence of calculus and pockets.

Dental caries experience is summarized in Table VI with mean scores for Decayed, Missing, and Filled Teeth (DMFT). Overall, the mean DMFT score was low at 2.44, with little difference according to immigrant status (t-test, $p<0.01$). The low "D" and "M" scores and higher scores for "F" reflect that many students have had access to dental care. The immigrant students experienced most of the dental decay with 15.1% identified with decay in one or more teeth. The majority of decay is found in the most recent immigrants. More than one-quarter (26.0%) of the students who immigrated within the preceding two years had decay in one or more teeth. In contrast, 3.8% of the Canadian-born students were identified with dental decay.

TREATMENT NEEDS

Table VII is a summary of the dental treatment needs as determined from the clinical examination. While less than one-tenth of the students required restorations or treatment of urgent conditions, more than one third (37.9%) were identified in need of periodontal treatment. Further analysis according to immigration history shows that most treatment needs are concentrated in the immigrant population. The data show that the recent immigrants have the most needs with more than one-fifth (22.9%) requiring restorations, one-tenth (10.4%) with urgent needs, and two-thirds (66.7%) requiring periodontal scaling.

DISCUSSION

This report summarizes the results of a study of the oral health status and treatment needs of Grade 8 students in North York. It describes differences in oral health status between Canadian-born and immigrant students. The data provide a baseline for a longitudinal study on the oral health of adolescents.

This study found low rates of dental disease in the overall sample of Grade 8 students with a concentration of disorders in a minority of cases. Students who were not born in Canada had more dental disease than Canadian-born students. Recent immigrants had the highest incidence of debris, calculus, periodontal disease, and restorative treatment needs.

The survey results suggest that there is a relationship between immigration history and oral health status as those who had been in Canada the longest had the best oral health. Students who had immigrated six or more years ago had the lowest scores for oral disease while students who immigrated within the preceding two years had the worst oral health and the most treatment needs of all the subjects studied.

While oral health status is influenced in part by cultural beliefs, attitudes and practices, the variations between Canadian-born and immigrant adolescents can also be due to differences in access to dental care. Immigrant adolescents may have had limited experience with dental treatment in their homelands resulting in neglected dental needs. In the host land, access to dental care can be limited due to language problems or unfamiliarity with the health care system. In addition, recent

immigrants are often economically disadvantaged and dental care is not a priority in their lives. While Canadian-born students in North York may have had access to private practitioners through dental insurance plans, they have also benefitted from years of exposure to dental public health programs such as water fluoridation, education, screening, referral, and/or treatment.

The data suggest that limited access to dental public health programs in Grade 8 may result in untreated conditions in some students. This is significant as Grade 8 is the last year of eligibility for any dental public health programs. As untreated dental disease leads to a lifetime of costly oral problems, early detection and treatment could help to prevent the deterioration of the oral health status of older adolescents.

The findings of this study have implications on program planning and treatment delivery for communities with high proportions of recent immigrants. If public health dental programs are to be directed to those most in need, efforts should be made to ensure optimal oral health for all Grade 8 students prior to cessation of their eligibility for programs. Given that the data show that the majority of oral disease is concentrated in the immigrant students, a cost-effective measure would be to focus preventive and treatment programs on this group. Attention should be given to the recent immigrants in Grade 8 as this is the group identified as needing the most attention. The data suggest that in addition to the current program of screening and referral for urgent conditions, consideration should be given to

redirecting resources to ensure the treatment of non-urgent conditions that can deteriorate over time.

Public health dental programs should also address the finding that periodontal disease is the most common disorder in the overall sample of Grade 8 students. Consideration should be given to ensuring that education and treatment are aimed at all Grade 8 students to reduce the incidence of periodontal disease and improving their oral hygiene before they cease to be eligible for dental public health programs.

TABLE I

SELECTED CHARACTERISTICS OF SUBJECTS

Number of participants:		721
Gender	**%**	**n**
Male	53.5	386
Female	46.5	335
Years Since Immigration to Canada	**%**	**n**
Did not immigrate (Born in Canada)	55.1	399
Immigrated ≥ 6 years ago	17.2	96
Immigrated 3-5 years ago	14.4	104
Immigrated ≤ 2 years ago	13.3	122

TABLE II

UTILIZATION OF DENTAL SERVICES BY YEARS SINCE IMMIGRATION

	SAW DENTIST IN LAST TWELVE MONTHS %	VISITS DENTIST AT LEAST ONCE A YEAR %
ALL SUBJECTS (n=721)	73.0	61.5
ALL IMMIGRANTS (n=322)	61.3	42.8
YEARS SINCE IMMIGRATION:		
DID NOT IMMIGRATE (Born in Canada) (n=399)	81.7*	76.8**
IMMIGRATED ≥ 6 YEARS AGO (n=96)	69.4	54.9
IMMIGRATED 3-5 YEARS AGO (n=104)	57.3	41.3
IMMIGRATED ≤ 2 YEARS AGO (n=122)	56.3	28.9

*, **: $p<0.0001$,Chi square test.

TABLE III

EXPERIENCE OF SYMPTOMS OF ORAL DISEASE IN PRECEDING FOUR MONTHS BY YEARS SINCE IMMIGRATION:

	TOOTHACHE %	BLEEDING GUMS %
ALL SUBJECTS (n=721)	12.7	19.4
ALL IMMIGRANTS (n=322)	13.9	18.6
YEARS SINCE IMMIGRATION:		
DID NOT IMMIGRATE (Born in Canada) (n=399)	14.0	19.0
≥ 6 YEARS AGO (n=96)	8.2	17.2
3-5 YEARS AGO (n=104)	14.4	20.2
≤ 2 YEARS AGO (n=122)	11.1	23.3

TABLE IV

MEAN DEBRIS AND CALCULUS SCORES AND PERCENTAGE WITH DEBRIS[@] AND CALCULUS[#].

	DEBRIS %	MEAN DEBRIS SCORE (SD)	CALCULUS %	MEAN CALCULUS SCORE (SD)
ALL SUBJECTS (n=721)	22.3	.42 (.97)	56.7	1.36 (1.61)
ALL IMMIGRANTS (n=318)	27.2	.55 (1.14)	44.9	2.03 (1.82)
YEARS SINCE IMMIGRATION:				
DID NOT IMMIGRATE (Born in Canada) (n=397)	18.5*	.32 (.80)+	44.6**	.83 (1.17)++
≥ 6 YEARS (n=96)	21.3	.43 (1.10)	64.8	1.52 (1.63)
3-5 YEARS (n=104)	28.8	.57 (1.11)	72.1	2.02 (1.76)
≤ 2 YEARS (n=122)	32.2	.67 (1.19)	80.2	2.65 (1.92)

* - $p<0.05$; ** - $p<0.0001$: Chi square test. + - $p<0.01$; ++ - $p<0.001$: ANOVA test.

@ Debris or stain on at least 2/3 tooth surface (for at least one of six indicator teeth).

Supra or subgingival calculus on at least one of six indicator teeth.

TABLE V

SUMMARY OF PERIODONTAL TREATMENT NEEDS (CPITN[1]) BY YEARS SINCE IMMIGRATION TO CANADA:

CPITN CATEGORY	**0** HEALTH	**1** BLEEDING	**2** CALCULUS	**3/4**[2] POCKETS	**MEAN CPITN SCORE** (SD)
	%	%	%	%	
ALL SUBJECTS (n=721)	28.7	13.0	55.1	1.5	1.43 (1.34)
ALL IMMIGRANTS (n=322)	16.0	11.7	68.5	2.2	1.69 (1.20)
YEARS SINCE IMMIGRATION TO CANADA:					
DID NOT IMMIGRATE (Born in Canada) (n=399)	39.0+	14.1★	44.1#	1.0*	1.21(1.40)@
IMMIGRATED ≥ 6 YEARS AGO (n=96)	15.6	22.1	62.3	0.0	1.47 (.75)
IMMIGRATED 3-5 YEARS AGO (n=104)	18.3	8.7	69.2	0.0	1.70 (1.30)
IMMIGRATED ≤ 2 YEARS AGO (n=122)	14.6	2.1	75.0	5.2	1.96 (1.49)

+, ★, #, *: $p<0.0001$, Chi square test. @ $p<0.0001$, ANOVA test.

[1] Community Periodontal Index of Treatment Needs
[2] Combined due to low prevalence of CPITN score 4

TABLE VI

MEAN NUMBER OF DECAYED (D), MISSING (M), AND FILLED (F) TEETH AND MEAN DMFT SCORE BY YEARS SINCE IMMIGRATION:

	% with one or more decayed teeth	D (SD)	M (SD)	F (SD)	DMFT (SD)
ALL SUBJECTS (n=721)	8.9	.22 (.92)	.71 (1.54)	1.51 (2.06)	2.44 (2.62)
ALL IMMIGRANTS (n=322)	15.1	.40 (1.27)	.63 (1.30)	1.88 (2.32)	2.90 (2.80)
YEARS SINCE IMMIGRATION TO CANADA					
DID NOT IMMIGRATE (Born in Canada) (n=399)	3.8[@]	.07 (.40)[#]	.78(1.70)[★]	1.21(1.77)[*]	2.06(2.40)[+]
IMMIGRANT ≥ 6 YEARS (n=96)	9.8	.15 (.50)	.54(1.17)	1.65(2.09)	2.34(2.37)
IMMIGRANT 3-5 YEARS (n=104)	11.5	.33(1.37)	.79(1.50)	2.45(2.46)	3.57(3.00)
IMMIGRANT ≤ 2 YEARS (n=122)	26.0	.79(1.70)	.58(1.25)	1.57(2.40)	2.95(2.95)

@: $p<0.0001$, Chi square test. #, ★, *, + : $p<0.0001$, ANOVA test.

TABLE VII

SUMMARY OF TREATMENT NEEDS BY YEARS SINCE IMMIGRATION:

	RESTORATIONS %	URGENT %	PERIODONTAL SCALING %
ALL SUBJECTS (n=721)	8.0	2.4	37.9
ALL IMMIGRANTS (n=322)	13.6	4.6	53.1
YEARS SINCE IMMIGRATION TO CANADA:			
DID NOT IMMIGRATE (Born in Canada) (n=399)	3.5*	0.5#	25.8@
≥ 6 YEARS AGO (n=122)	8.2	1.6	38.5
3-5 YEARS AGO (n=104)	11.5	2.9	56.7
≤ 2 YEARS AGO (n=96)	22.9	10.4	66.7

*, #, @ : $p<0.001$, Chi-square test.

REFERENCES

1. Johnston DW, Grainger RM, Ryan RK. The decline of dental caries in Ontario school children. Journal of the Canadian Dental Association 1986; 52(5): 411-41.

2. Williams SA, Fairpo CG, Curzon MEJ. Dental Attendance Patterns of Inner City Pre-school Children from Different Ethnic Origins. Journal of Dental Research 67(4):679, 1988.

3. Bradnock G, Jadoua S, Hamburger R. The Dental Health of Indigenous and Non-indigenous Infant Schoolchildren in West Birmingham. Community Dental Health 1:139-150, 1988.

4. Prendergast MJ, Williams SA, Curzon MEJ. An Assessment of Dental Caries Prevalence Among Gujurati, Pakistani and White Caucasian Five-Year-Old Children Resident in Dewesbury, West Yorkshire. Community Dental Health 6(3):223-232, 1989.

5. Laher MHE. A Comparison Between Dental Caries, Gingival Health and Dental Service Usage in Bangladeshi and White Caucasian Children Aged 7,9,11,13 and 15 Years Residing in an Inner City Area of London, UK. Community Dental Health 7(2):157-163, 1990.

6. Bedi R, Elton RA. Dental Caries Experience and Oral Cleanliness of Asian and White Caucasian Children Aged 5 and 6 Years Attending Primary Schools in Glasgow and Trafford, UK. Community Dental Health 8(1):17-23, 1991.

7. Lee J. Comparison of the Dental Health of Toronto's Ethnic Groups. Canadian Journal of Community Dentistry 2(2):8-12, 1987 July.

8. Locker D, Payne B. Inequities in Oral Health: Ontarians aged 12-19 years. An analysis of data from the Ontario Health Survey 1990. Community Dental Health Services Research Unit: Health Measurement and Epidemiology Report No. 4, 1993.

9. Clarke M, Locker D, Murray H, Payne B. The Oral Health Status of 'High Risk' Adolescents in North York. Community Dental Health Services Research Unit: Health Measurement and Epidemiology Report No. 8, 1994.

10. Clarke M, Locker D, Murray H, Payne B. The Oral Health Status of 'High Risk' Adolescents in North York: Clinical Findings. Community Dental Health Services Research Unit: Health Measurement and Epidemiology Report No. 10, 1995.

11. City of North York Public Health Department. North York Social Profile--Update. February 1995.

12. Greene JC, Vermillion JR. The Simplified Oral Hygiene Index. Journal of the American Dental Association 68: 25-31, 1964.

13. Ainamo J, et al. Development of World Health Organization (WHO) community periodontal index of treatment needs (CPITN). International Dental Journal. 32(3):281-291, 1982.