

PHEROPublic Health and
Epidemiology Report Ontario

Volume 13, Number 1

<http://www.health.gov.on.ca>

January 28, 2002

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- November 2001

The Public Health and Epidemiology Report Ontario
is published monthly, by the:

Public Health Branch
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Toronto, Ontario, M2M 4K5
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OPERATIONALIZATION OF THE IMMUNIZATION OF SCHOOL PUPILS ACT: 2000/2001 SCHOOL YEAR

Introduction

During the summer of 2001, the Public Health Branch of the Ministry of Health and Long-Term Care surveyed the 37 local health units in Ontario regarding the operationalization of the requirements under the *Immunization of School Pupils Act* (ISPA), 1990. The purpose of the survey was to provide an overview of the different strategies and processes the health units have implemented to meet these requirements and the effectiveness of the different strategies.

Background

In Ontario, all students under the age of 18 who attend school must demonstrate proof of immunization against specific communicable diseases (i.e. diphtheria, polio, tetanus, measles, mumps and rubella), or provide a statement of conscience or religious belief or a statement of medical exemption under the ISPA.¹

In the Mandatory Health Programs and Services Guidelines or MHPSG (1997), the Vaccine Preventable Disease Program specifies a 95 percent vaccination coverage objective for specific communicable diseases. It is also specified, as an objective of this program, that "the board of health, annually, shall assess and maintain records of the immunization status of children attending all schools in accordance with the Immunization of School Pupils Act." ²

In 1993, the Immunization Record Information System (IRIS) was instituted in order to facilitate electronic student immunization record collection and retrieval by health units. The IRIS was designed to replace the School Health System (SHS), a centralized data base system that did not allow health units access to their own data. Health units utilizing SHS were required to manually update student records within their jurisdiction and send this information to the ministry for entry into the SHS. The IRIS enables health units to have access to their database and automates assessment of immunization records using predetermined immunization schedule logic specific to the age of the

child. Using the IRIS, health units are able to identify those students who have incomplete records or are inadequately immunized for their age.

The IRIS can also be used to generate forms to facilitate the collection of immunization information. Although all health units are mandated to record student immunization information, health units are not required to use IRIS or IRIS-generated forms to record and collect immunization information. In addition, health units use different strategies in order to review and collect immunization records of school children within their jurisdiction.

This paper will report on summary information for health units related to the immunization information collection process to demonstrate how the ISPA has been operationalized in the field.

Methods

In July 2001, a survey was designed in order to summarize the process by which health units collect immunization information mandated by the ISPA. The survey was composed of both open and close-ended questions.

The questionnaire inquired about the frequency of student record reviews and record accrual strategies, response rates and timelines involved in the distribution of letters of inquiry. These letters are sent to the child's parent or guardian and typically state that the student's immunization status is incomplete or unknown and that updated records must be forwarded to the local health unit. Within the questionnaire, school board support for the collection process and parent/guardian comments about letters of inquiry were also explored.

A preliminary version of the survey was circulated to Vaccine Preventable Disease (VPD) program staff in five health units; revisions were made based on responses to the preliminary instrument.

The final survey was mailed to all thirty-seven VPD managers, representing all local health units in Ontario. A letter of introduction accompanied the survey explaining the purpose of the questionnaire, and assured participants that information collected would be used for summary purposes only. The instrument was self-administered; results were based on reported information for the 2000/2001 school year.

Results

Of 37 eligible health units, 35 completed and returned the survey. This resulted in a response rate of 95 %.

Notices of inquiry

Forty-six percent of health units utilized the IRIS-generated information questionnaire form for first parent/guardian contact, as opposed to other IRIS forms (17 %), health unit prototypes (26 %), or combination of prototype and IRIS form (12 %).

Most health units (51%) sent two letters of inquiry prior to issuing the notice of suspension, while 31 % and 17 % sent one and three notices respectively. No health unit sent more than three notices (Figure 1). Parents/guardians were typically permitted three to four weeks to respond before the next notice was sent.

Figure 1: Typical number of inquiry notices sent by Health Units

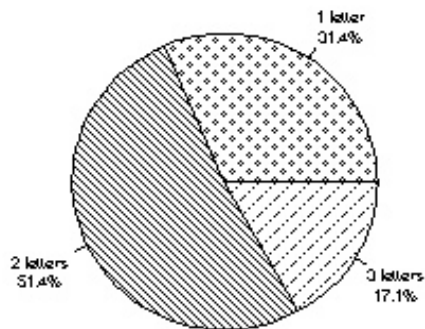


Table 1 delineates parental/guardian response rates in relation to the number of letters of inquiry sent by the health unit. All health units sent either one, two or three letters of inquiry prior to issuing the notice of suspension; response rates were categorized by letter system utilized. It is important to note that response rates could not be accurately gauged by all health units. In some cases, this figure represents an approximation.

Response rates of greater than 50 % are considered typical for mailed questionnaires.³ Therefore the authors used this "cut-off" in the questionnaire to analyze the estimated response rates.

Of the 25 health units who sent notices of suspension separately from letters of inquiry, all but one health unit reported a response rate of greater than 50% for the notice of suspension.

Parental comments

The vast majority of health units (97%) reported having received parental/guardian comments about letters of inquiry. The majority of comments related to parents/guardians seeking clarification of the child's immunization status and complaints about wording of forms (i.e. "too harsh") used to obtain this information. Some of the more frequent comments related to requests for more information about the suspension process, and complaints related to a perceived invasion of privacy. (Table 2)

Table 1							
Strategy	No. of health units	Response to first letter		Response to second letter		Response to third letter	
		Response rate <50%	Response rate >50%	Response rate <50%	Response rate >50%	Response rate <50%	Response rate >50%
1 letter	11	45%*	36%*	N/A	N/A	N/A	N/A
2 letter	18	56%	44%	61%†	33%†	N/A	N/A
3 letter	6	67%	33%	67%	33%	50%	50%
* 2 health units did not collect this information							
† 1 health unit did not collect this information							

**Table 2 Parental comments received by health units regarding letters of inquiry
(Ranked by frequency of response)**

- Seeking clarification of child's immunization status
- 1. Complaints about wording of the form ("too harsh")
- Requesting more information about suspension process
- Complaints about a perceived invasion of privacy
- Parents assume physician forwards immunization information to health unit directly
- IRIS form difficult to understand

Many parents/guardians believed that the child's primary care practitioner routinely forwards immunization information to the appropriate health unit. These parents were unaware of their responsibility to submit this information.

Student record review strategy

Most health units (57 %) reviewed all student records within their jurisdiction on an annual basis. Of those who were not able to perform a yearly review of all student records, a low coverage rate and age/grade were selected as the most common methods by which student records were targeted for review (33% and 27% respectively).

Methods employed to collect immunization information

In order to collect immunization information on those children whose records were missing information, most health units either mailed a letter to the parent/guardian (27%) or employed a combination of letter and personal contact (37%). A letter alone or letter plus personal

contact were also used to contact parents/guardians of children listed as "due" for mandated vaccinations, at 46 % and 17 % respectively. In addition to focusing on children who are "overdue" or "missing information", 71% of health units contacted parents/guardians of children who were "due" for vaccination to update immunization information.

Strategies utilized to facilitate ISPA compliance
Strategies identified to facilitate compliance with the ISPA included: conducting health unit immunization clinics, enhancing public and physician awareness of immunization, or direct contact of family physicians in order to obtain needed information. (Table 3)

Less frequently, health units reported altering IRIS forms to enhance parent/guardian comprehension. Four health units contacted a number of family physicians directly in order to obtain immunization information. Two health units asked a subset of physicians in their area to voluntarily fax in lists of vaccines administered to school-aged clients.

Table 3 Strategies identified by health units that facilitate compliance with ISPA

- Regularly scheduled clinics offered
- 1. Public awareness campaign (Media releases, posters in physicians' offices, etc.)
- Newsletters to physicians
- Phone call to parent/guardian by Public Health Nurse from health unit
- Health unit contacts family practitioners for immunization history

Number of student records targeted for review

A total of 1,277,301 students (range: zero to 229,596 students per health unit; median 23,000) were targeted for immunization record review during the 2000-2001 school year. A questionnaire was generated for 416,674 of these individuals (range: zero to 92,168; median: 5,347). Therefore, questionnaires were administered to thirty-three percent of those targeted for record review in order to collect immunization information.

The one health unit that did not conduct a record review during the 2000-2001 school year cited the allocation of resources to the universal influenza immunization program as the reason for not addressing this requirement of the MHPSG.

Student suspension

Suspension was widely viewed by health units as an option of last resort, utilized only when all other strategies to acquire information were unsuccessful. Twenty-six of the thirty-five health units surveyed suspended students during the 2000/2001 school year. A total of 12,179 students were suspended during that time frame (range: one to 4888; median: 99).

Once a suspension order for a student is issued, it is effective for a period of 20 school days as long as the parent/guardian remains non-compliant with the health unit request for immunization information including documentation of an exemption. Over half (51 %) of the 26 surveyed health units that suspended students re-issued suspension orders (for an additional 20 days if

needed) if the required immunization information was not submitted by the parent/guardian. Of those who did not re-issue suspension orders, 44 % responded that the reason for the suspension was resolved (e.g., appropriate information was provided) prior to the suspension deadline, 33 % reviewed each student on a case-by-case basis and 17 % chose not to re-suspend without further follow up. Because of time constraints (i.e. end of the school year), one health unit will suspend those students lacking immunization information during the 2001/2002 school year. Eighty-three percent of health units offered immunization clinics to students prior to their suspension date.

Table 4 outlines the proportion of students suspended by letter inquiry system used (i.e. one, two or three-letter system). This proportion was calculated by dividing the total number of students suspended into the total number of students to whom questionnaires were administered. The proportion of students suspended remained constant between one and two-letter systems but increased 39 % with the use of the three-letter system.

Influence of school board policies

A number of health units identified school board policies that facilitated the collection of immunization information. Such policies included the distribution of immunization record requests to new school registrants by school staff, and school staff participation in immunization record collection of current students.

Strategy	Number of health units	Number of students targeted for record review in 2000/2001 school year			Total no. of students administered questionnaires	Total no. of Students suspended	Proportion suspended
		Total	Mean (Median)	Range			
1 letter	11	421,747	38,341 (28,001)	1,597-134,780	112,557	2935	2.6 %
2 letter	18	424,607	24,977 (18,737)	0-133,116	135,262	3760	2.8 %
3 letter	6	430,947	71,825 (40,937)	14,499-229,596	137,945	5394	3.9 %

Direct involvement of the principal on the day the suspensions became effective was also reported to be beneficial.

Health units also reported policies that impeded collection, including information regarding student transfers submitted in paper, rather than electronic format, resulting in delayed information transfer, and school staff who were unaware of their role in the collection process. Respondents were more likely to report that school boards facilitated the collection process, rather than impeded it (66 % vs. 34 %).

Collection process

Forty percent of health units distributed inquiries for immunization information by mail, while 37 % had school staff deliver them. Of those who used school staff in the distribution process, sixty-five percent had designated school staff collect the immunization records.

The most common method used to collect immunization histories for new school registrants (i.e. kindergarten/ Grade 1 students or new transfers) was the distribution of information requests by school staff, with the parent/guardian returning information to either the school or health unit (40 %).

Fifty-one percent of health units have conducted an evaluation examining their process of collecting immunization information in the past.

Discussion and Conclusions

Information Collection

Seventy-five percent of health units used some type of IRIS-generated form for first parent/guardian contact. This survey found that 51 % of health units sent two letters of inquiry prior to issuing a notice of suspension, 31 % sent one, while 17 % sent three.

Regardless of the number of letters sent by each health unit, the letter with the highest rate of response was most often the notice of suspension. The most likely explanation for the high response rate associated with the notice of suspension relates to the specific and impending implication that the child will be suspended (e.g. "Attached please find a copy of the order suspending the student from school"). Health units which utilized one letter inquiry systems used forms with more strongly worded language for initial parent/guardian contact (e.g. "This student may be suspended from school if you do not complete and return this form"). Those health

units which used two or three letter systems often used less direct language for first parent/guardian contact (e.g. "It is important to complete this information"). Higher response rates attained for the third letter of inquiry can likely be attributed to the use of more strongly-worded forms (e.g. "The Medical Officer of Health has the authority to suspend a child from school until these requirements of the Immunization of School Pupils Act are met. The suspension may last up to 20 days and may be repeated as often as necessary"). Thus a firmer stance from the outset may influence parents/guardians to submit immunization information, consequently reducing suspensions.

Some VPD program managers have expressed concern that if less potent language is used, the inevitable consequence will be reduced response rates, increased numbers of students suspended, resulting in greater financial and human resource allocation required for the suspension process. Six health units which have evaluated different strategies have chosen to reduce the number of notices they send to parents/guardians and have not noted a decrease in the amount of immunization information received, nor an increased number of students suspended.

The decision of these six health units is supported by the figures in Table 4. The proportion of students suspended was highest for those health units which used a three-letter inquiry system. There was no difference in the proportion of students suspended between health units using one or two-letter systems.

This finding may alleviate concerns of health units which perceive that decreasing the number of inquiry letters sent would result in an escalation in the number of suspensions. The ISPA does not specify a minimum number of requests that must be sent to parents before a suspension order is issued.

Record Review

Fifty-seven percent of health units reviewed all of their student records in 2000/2001 as required in the MHPSG. Just under 1.3 million of the approximately two million school-aged children in Ontario (64%) were targeted for record review for the 2000/2001 school year. One health unit reported that, due to the introduction of the universal influenza immunization program, they did not review any records in that school year. It is an expectation that appropriate resources be allocated to

ensure that health units are able to address and meet the requirements of the Vaccine Preventable Diseases Program to review all records for school children on an annual basis.

In order to facilitate the collection of information, many health units offered immunization clinics; such clinics were often conducted at the child's school. The importance of immunization was promoted through public awareness campaigns through the use of school newsletters, local newspapers and posters in physicians' offices. Physicians were informed of immunization information through articles published in professional journals and health unit newsletters.

Some health units have found it advantageous to contact family practitioners directly to obtain immunization information. Four respondents contacted physicians directly in order to obtain such information, while two respondents asked physicians to fax a list of school-aged clients who had received mandated vaccines. The health units in the latter example reported physician compliance with this policy, although a number of physicians requested that parents/guardians submit this information to the health unit.

Parental comments

Parental comments received by health units were most frequently related to clarification of the child's immunization status and complaints about the perceived harsh wording in the forms. This survey also found that many parents/guardians believed that family physicians forward immunization information to health units; thus, enhancing parental awareness of their responsibility in submitting information may improve information collection. Should health units opt to reduce the number of letters of inquiry sent, negative comments from parents/guardians may increase. Although some parents/guardians perceive the language related to non-compliance (i.e. suspension) used in IRIS forms is too "harsh" (PHERO July/August 2000), evidence from this survey suggests that the risk of suspension provides an essential impetus for parents/guardians to submit necessary information. If less potent language is used, it would appear that the inevitable consequence will be reduced response rates.

At least one health unit that has been looking into revising the standard IRIS questionnaire recommended that more prominence on the form be given to the issue

of parent/guardian responsibility to submit immunization information to health units, as many parents believe physicians forward this information. It would be beneficial if this key message could be reinforced through several different channels, for example physician offices, school mailings, and other health unit programs (e.g. the Healthy Babies/Healthy Children Program). It was also noted that parental/guardian understanding of the language of the form may be facilitated by including "baby shots/needles" along with "immunization" on all correspondence.

School board policies

Health units reported that school board policies and practices were more likely to facilitate immunization information collection than to impede it. Those health units which developed collaborative relationships with school staff found such relationships to have great success, since a consistent message about immunization was communicated. In order to enhance uniformity, many health units suggested that principals and school staff would benefit from an orientation from the school board about their role in the process. Specific Board of Education staff (i.e. principals and secretaries) may benefit from presentations by health unit staff as to their role in the facilitation of parental/guardian compliance with the ISPA.

In order to ensure early compliance with the ISPA, it would be beneficial if school staff insisted on a copy of each new registrant's immunization record **prior** to school entry. If the principal is supportive of this "policy", it could be "enforced" under the Education Act, in which a principal may refuse to admit to the school or classroom a person whose presence in the school or classroom would, in the principal's judgment, be detrimental to the physical or mental well-being of the pupils.⁴ As reported in a recent California study, "...when school entrance requirements are enforced, high vaccination coverage can be achieved" (Page 660, MMWR August 10, 2001.)

Additionally, electronic transfer of student enrollment information would expedite student information updates; this survey revealed that not all health units were provided with such information.

Information dissemination

It would be beneficial for all health units to gain from the experiences of others. This may be done though a

VPD program e-mail list whereby questions, comments and experiences can be shared. This may facilitate the sharing of information, insights, redrafted forms and other valuable information. For example, 18 health units have undergone an evaluation of their immunization collection process. Significant benefits could be realized through the sharing of information and "lessons learned".

The goal of all health units is to ensure that all children are appropriately immunized and that this information is recorded; through the dissemination of successful strategies, progress towards this goal can be achieved.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the assistance of the Vaccine Preventable Disease managers who participated in the Immunization Record Collection Survey.



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BEACH WATER SAMPLING INVESTIGATION, SUMMER 2000

Current guidelines from the Ministry of Health and Long Term Care (MOHLTC) for beach sampling recommend a minimum of five samples taken once a week, at specified sites along each waterfront, using standard procedures.¹ At Durham Region Health Department there was concern that five samples taken once a week may not provide sufficient and timely information to inform beach postings. In addition, debate over the best summary measure on which to base beach posting decisions has arisen. In Ontario, beach posting usually occurs when the summary measure from water samples gives E. coli counts greater or equal to 100 per 100 ml.² When E. coli counts are near 100/100ml, beach posting decisions may include beach history, rainfall and temperature. The Federal standard is 200 counts per 100 ml water.²

Methods

Each of the 16 designated beaches in Durham Region was sampled twice a week, June through August 2000, and the results of this strategy were compared with those that would have been obtained from the standard practice of sampling once per week (i.e. ignoring the second sampling per week). In general, five samples were taken on Monday and five on Wednesday. The Monday samples alone were considered for the comparison data. For three of the sixteen beaches an additional five samples were taken on the Monday at sites between the usual beach sampling locations, totalling 10 samples per beach once per week. The five samples twice a week were used as the 'gold standard' to compare with the ten samples once per week and the five samples once per week.

Comparison of summary measures

Gmean. This refers to the geometric mean of the samples taken on one occasion. The geometric mean is the antilog of the average of the log of the individual values. A few high values have less influence on the geometric mean than they would for the calculation of a regular mean.³

The Pmean is calculated by finding the geometric mean of the current samples and those from the previous sampling day.

The overall Run is calculated as the geometric mean of the Gmean (the current day's samples) and the previous Run. **The Run for the first day of samples (Run 1) is the same as the Gmean. The Run for the second sampling day (Run 2) is the same as the Pmean. Run 3 is the geomean of the Gmean and Run 2, and Run 4 is the geomean of the Gmean and Run 3, etc. Thus, the overall Run gives more weight to current samples than previous ones.**

The comparative effectiveness of the three measures was considered in relation to four criteria:

- number of separate occasions on which the beach was posted after being open (number of beach postings)
- total number of days the beach was posted

- number of days the beach was posted when it should have been open
- number of days the beach was open when it should have been posted.

Samples from any sampling day take approximately three days to process and obtain the results. This means that the decision to post a beach is based on information prior to the current sampling day. For convenience, the number of days refers to the number of sampling days rather than considering all the days of the week i.e. 2 sampling days per week. For the purpose of this study, beaches were assumed to be posted on the sampling day following a value of over 100 E. coli per 100 ml., and to remain posted until the sampling day following a value below 100/100ml.

Table 1. Example from one beach of the Gmean, Pmean and Run based on five samples taken twice a week for eleven weeks.

Gmean	Beach should be	Based on prior Gmean, Beach is:	Pmean	Based on prior Pmean, Beach is:	Run	Based on prior Run Beach is:
78	Open	- (Open)	78	- (Open)	78	- (Open)
479	Posted	Open	193	Open	193	Open
765	Posted	Posted	605	Posted	384	Posted
156	Posted	Posted	345	Posted	244	Posted
75	Open	Posted	108	Posted	135	Posted
91	Open	Open	82	Posted	111	Posted
283	Posted	Open	160	Open	177	Posted
14	Open	Posted	64	Posted	50	Posted
12	Open	Open	13	Open	25	Open
182	Posted	Open	48	Open	67	Open
10	Open	Posted	43	Open	26	Open
21	Open	Open	14	Open	23	Open
18	Open	Open	19	Open	20	Open
32	Open	Open	24	Open	26	Open
24	Open	Open	27	Open	25	Open
309	Posted	Open	85	Open	87	Open
14	Open	Posted	66	Open	35	Open
200	Posted	Open	54	Open	84	Open
10	Open	Posted	48	Open	29	Open
121	Posted	Open	35	Open	59	Open
11	Open	Posted	37	Open	26	Open
104	Posted	Open	35	Open	52	Open

The actual state of the water in this study was assumed to be the Gmean value of the samples taken on any one occasion. Although this information is not available at the time of sampling, it was available retrospectively, and enabled a comparison of the state of the beach (open or posted based on the previous sampling day) with the current state of the water (above 100 E. coli - should be posted, or below 100 E. coli - should be open).

Results

Beach sampling occurred twice a week for 11 weeks in the summer, from June 19 through August 30. Three of the 16 beaches were not sampled in the final 2 weeks for practical reasons.

Table 3 shows that the outcome for beach postings was similar if either the Pmean or Run was used but using the Gmean resulted in more beach postings and days when the beach was posted when it should have been

open. The number of days when the beach was open when it should have been posted was similar for all three measures. The Run and Pmean appeared to give better results than the Gmean.

The Run was then used to compare the effect of different sampling strategies: 5 samples twice a week, 5 samples once a week, and 10 samples once a week, per beach. The Gmean at the time of sampling was again used to decide whether the beach should or should not have been open. Ten samples once a week only applied to 3 beaches. For all 3 beaches on every occasion if the value of the Run from the 5 sample was below 100 E. coli per ml then the Run from the 10 sample was also below 100 and vice versa. The results for the 10 sample versus the 5 sample once a week for the 3 beaches were therefore identical. Only the comparison between the 5 sample once versus twice a week is shown (Tables 4-6, Figure 1).

Table 2. Summary data for the same beach based on information from table 1.

Measure used for beach posting	# Times posted	# days posted	# days open	# days beach Posted but should have been Open	# days beach Open but should have been Posted	Total # days of sampling
Gmean	6	8	14	6	7	22
Pmean	2	5	17	3	7	22
Run	1	6	16	3	6	22

Table 3. Summary data for all 16 beaches combined.

Measure used for beach posting	# Times posted*	# days posted	# days open	# days beach Posted but should have been Open*	# days beach Open but should have been Posted	Total # days of sampling
Gmean	61	91	252	57	60	343
Pmean	27	72	271	31	59	343
Run	28	75	268	37	58	343

* Statistical significance based on Chi square test

Table 4. Example from one beach of sampling twice versus once a week, 5 samples per occasion, using the Run.

Gmean	Beach should be	Sampling twice a week. Run	Twice a week. Based on prior Run Beach is:	Sampling once a week. Run	Once a week. Based on prior Run Beach is:
78	Open	78	- (Open)	78	- (Open)
479	Posted	193	Open		Open
765	Posted	384	Posted	244	Open
156	Posted	244	Posted		Posted
75	Open	135	Posted	135	Posted
91	Open	111	Posted		Posted
283	Posted	177	Posted	195	Posted
14	Open	50	Posted		Posted
12	Open	25	Open	49	Posted
182	Posted	67	Open		Open
10	Open	26	Open	22	Open
21	Open	23	Open		Open
18	Open	20	Open	20	Open
32	Open	26	Open		Open
24	Open	25	Open	22	Open
309	Posted	87	Open		Open
14	Open	35	Open	20	Open
200	Posted	84	Open		Open
10	Open	29	Open	14	Open
121	Posted	59	Open		Open
11	Open	26	Open	13	Open
104	Posted	52	Open		Open

Table 5. Summary data for the same beach based on information from table 4.

Sampling method	# Times posted	# days posted	# days open	# days beach Posted but should have been Open	# days beach Open but should have been Posted	Total # days of sampling
Twice per week	1	6	16	3	6	22
Once per week	1	6	16	4	7	22

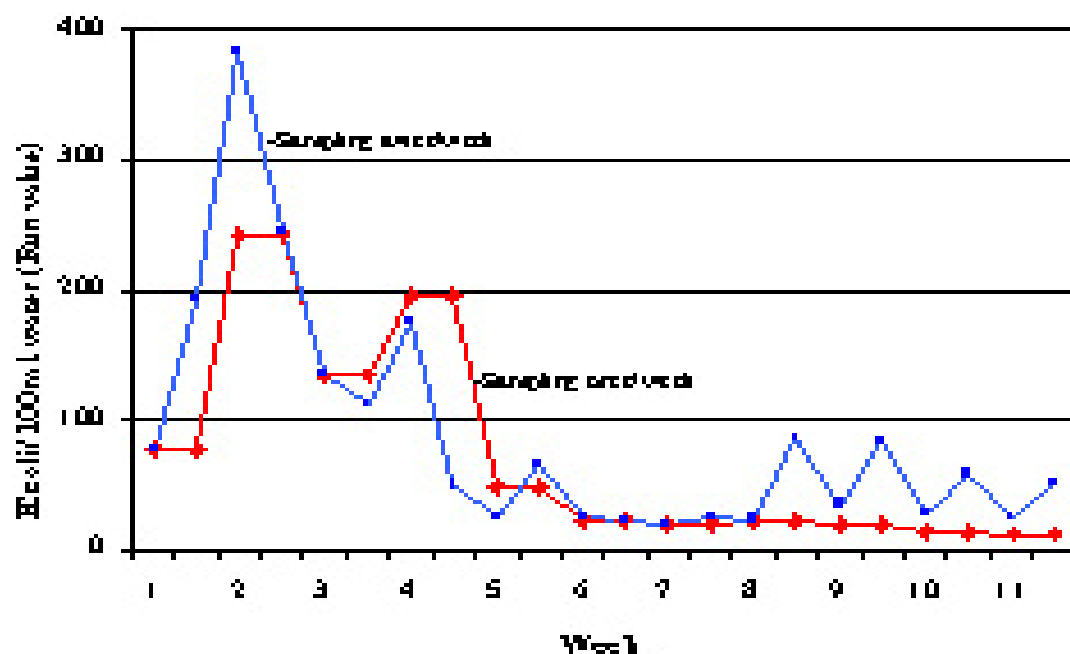
Table 6. Summary data for all 16 beaches combined.

Sampling method	# Times posted	# days posted*	# days open	# days beach Posted but should have been Open	# days beach Open but should have been Posted	Total # days of sampling
Twice per week	28	75	268	37	58	343
Once per week	16	54	289	34	73	343

*Statistical significance based on Chi square test

Figure 1

Comparison of Bm values for sampling twice versus once a week, for one beach in Durham Region, summer 2000



L. Thompson and others, unpublished data, July 9, 2001

Sampling twice a week appeared to lead to more beach postings, and to more days when the beach was posted and to fewer days when the beach was open when it should have been posted (Table 6). However, none of the apparent differences in outcomes between the 2 sampling methods were statistically significant except for number of days posted ($p=0.04$), for all beaches combined over the 11 weeks of summer 2000 sampling. The beaches were posted more days as a result of sampling twice a week versus once per week. A larger sample would increase the study power to show significant differences, although trends towards significance can also disappear with a larger sample size. For example, sampling twice versus once a week appeared to result in fewer days when a beach was open when it should have been closed (58 versus 73 days). A Chi square test showed a 15% probability of finding this great a difference by chance alone. A larger sample size might confirm that this difference was statistically significant but it could also show a smaller relative magnitude of the two values that would not be significantly different.

Graphs for each beach, comparing the Run for the two sampling methods, showed very similar patterns for the two sampling methods, but the changes were less extreme for the sampling once per week than for twice per week, (see Figure 1 for an example).

Summary

Comparison of measures

Since immediate results of beach samplings are not available until a few days later, both the Run or Pmean appear to give a more reliable indication than the Gmean of whether the beach should be open or posted.

Comparison of sampling

For three beaches this summer, there was no added benefit of taking 10 samples versus 5 samples per occasion.

Sampling twice rather than once per week resulted in more days when beaches were posted. There were no other statistically significant differences in the outcomes from the two sampling methods, although, the study may have lacked the power to detect other differences. The extra work involved in sampling beaches twice versus once per week was not justified.

This study did not consider other factors such as water temperature, wind direction or beach topography that may also impact on E. coli in the water.



SOURCES

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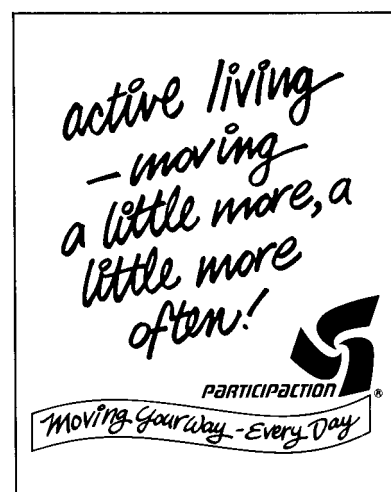
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THE HEALTH BUS - ADDRESSING EQUAL ACCESS IN REGIONAL NIAGARA

An Historical Overview

In 1996, Niagara District Health Council spearheaded a Homeless Project, an initiative undertaken in response to a community request to provide some health services to the identified population. This Project resulted in the Report on Homelessness in Niagara, 1997.¹ The study described the target population as not accessing or denied access to traditional services due to a variety of barriers. Inadequate or no housing, socially isolated and transient, were identified as barriers, while the most significant barrier was lack of trust of professional services.

The initial Project (Health Connection) started as a needs assessment of this population and provided a drop-in service at the Housing Help Centre in St. Catharines. Through this initiative numerous preventive health services, including immunizations, dental assessments, health counseling and referrals, were offered. From that initial step, Public Health Department staff worked closely with a variety of community partners, including the Hard-to-Serve Committee of St. Catharines, to explore innovative ways to meet the needs of the targeted group.

In order to determine the needs of the targeted population, 71 agencies were surveyed and identified the following service needs:

- Mental health counseling;
- Client referrals (e.g., physicians, dentists, social service agencies and programs);
- Dental assessment, preventive and treatment services;
- Assistance in getting an Ontario Health Card Number (OHCN);
- Minor health care; and
- Immunization.

In subsequent meetings with partnering agencies, the Health Connection Project developed goals and objectives for the services and were as follows:

- To identify and create innovative responses to the needs of the hard-to-serve and isolated population in Regional Niagara;

- To increase access to preventive clinical health services for those in need in Regional Niagara;
- To creatively use existing resources, in partnership with community agencies, to develop and advocate for programs for the hard-to-serve and isolated population;
- To strengthen linkages with and facilitate referrals to hospitals, physicians, dentists and community services that encounter and treat the target population; and
- To establish trust with the target population by listening to and developing services to meet their needs.

The concept of a mobile health service was suggested to the Medical Officer of Health in early 1998 by representatives from the Wise Guys Charity and Community Care, St. Catharines and Thorold. The mobile service was modeled after a service operated by the Wellesley Hospital in Toronto that provides a mobile clinic for the hard-to-serve and isolated population in the city's core area.

The Wise Guys Charity, in consultation with staff from the Public Health Department, purchased and retrofitted a ten-metre Blue Bird school bus to provide mobile health services to homeless and geographically isolated Niagara residents. The Health Bus was then donated to the Region and named in memory of the late Mayor of St. Catharines, Joe McCaffery. Various companies throughout Niagara contributed donations of time and money toward outfitting the vehicle, now valued at approximately \$250,000.

The Health Bus was designed to provide such services as treatment for minor medical conditions, mental health counseling, foot care, dental screening, preventive services and referral, immunization, health education, illness prevention, sexually transmitted disease counseling, testing and treatment, and health promotion. The Bus currently travels to ten sites weekly throughout the Niagara Region.

The Health Bus began operating on September 1, 1999, parking at various locations including community agencies that serve the vulnerable clientele that this service reaches. The Public Health Department provides rotational staffing through the services of registered nurse practitioners, public health nurses, dental hygienists and dental assistants, and a community

support worker. A full-time Team Leader is responsible for the coordination of services, driving the Bus and personally providing discipline-specific services. Physician consultation is provided on a contract basis. Seasonal scheduling enables the Bus to reach 'Out of the Cold' participants during the winter along with the migrant workers and youth during the summer.

During the first 9 months of operation, statistics showed that:

- 101 people received medical/dental health services;
- 56% of the clients were men and 44% were women;
- The majority of people being served ranged between 26 and 55 years of age;
- 253 people received dental services, 111 of whom were seen for pain and 106 for cleaning;
- 848 people received medical attention; and
- 161 vaccinations were given.

A Focus on Dental Services

The growth and utilization of dental services on the Health Bus has been a remarkable story. During the early planning stages, local dentist participation, either as a voluntary service or as a paid service, was sought. The primary reason was to allow clients to receive emergency dental treatment on the bus without having to seek treatment through a referral process. Historically, only 50% of hard to reach individuals visit a dentist annually 2-8, while public health dental programs consistently show utilization rates that approximate 33%-16.

On this basis, it was thought that this vulnerable clientele would have even lower utilization rates and would never receive the emergency care needed. Local dentists, however, were unwilling to participate, citing the following concerns:

- Ownership of treatment records;
- Perceived lack of adequate space; and
- Inability to complete client treatment might be contrary to the Royal College of Dental Surgeons of Ontario guidelines.

Therefore, dental services were, and still are, limited to needs assessments, cleanings and referral for emergency treatment.

First Year of Operation - 2000

During the first full year of operation statistics showed that:

- 542 clients received dental needs assessments and cleanings;
- 286 clients (in pain) were referred for emergency treatment; and
- 205 clients received treatment for emergency dental care (i.e., 72% utilization rate).

Second Year of Operation - 2001

During the second year of operation statistics showed that:

- 1412 clients received dental needs assessments and cleanings (an increase of 260% over 2000);
- 755 clients (in pain) were referred for emergency treatment (an increase of 264% over 2000); and
- 599 clients received treatment for emergency dental care (i.e., 79% utilization rate - an increase of 292% over 2000).

Although local dentists may be unwilling to provide services on the Health Bus, 110 of 197 local dentists (56%) have provided emergency treatment, in their dental offices, to referred clients during 2001.

Dental staff on the Health Bus does not select dentists for clients, book appointments, nor provide transportation to dental offices for treatment. The remarkable utilization rate (79%) of this clientele to obtain emergency dental treatment appears to be indicative only of their true need, when they are sought out, identified and referred. This will be investigated in future years.



SOURCE

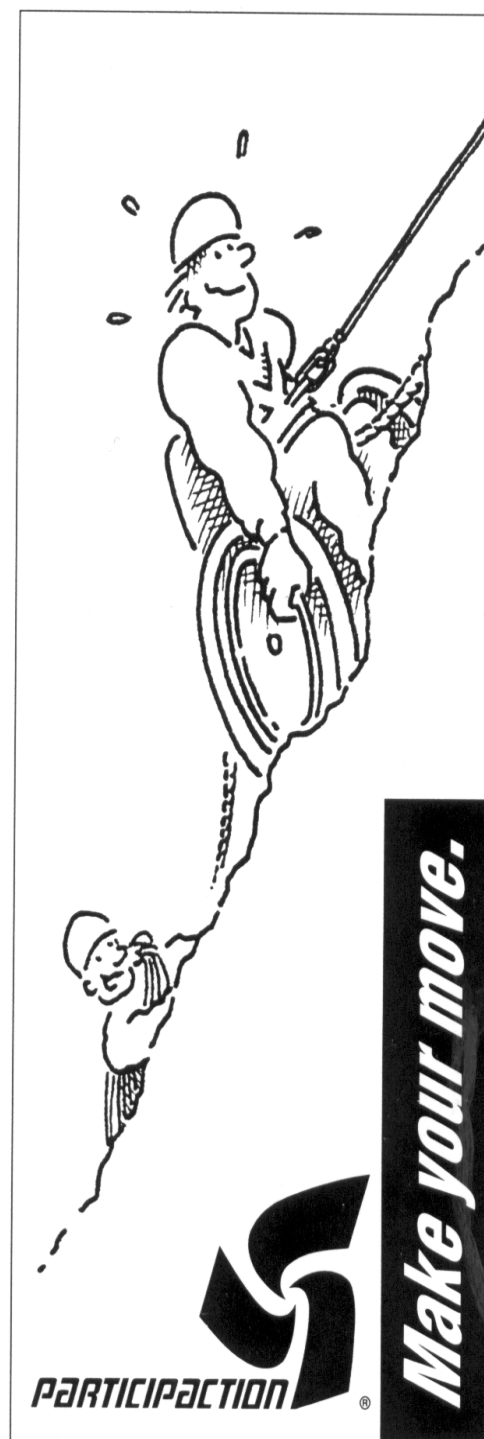
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Summary of Reportable Diseases in November, 2001

Health Units by Region	Population 2000	AIDS	Campylo.	Chicken-pox	Chlamydia	Enceph./Meningitis	GAS	Gonorrhea
Algoma	125,109		1	29	11			2
North Bay	93,505		3	60	11			1
Northwestern	91,920			41	16		1	1
Porcupine	93,680			16	8			
Sudbury	199,619		7	1	13		1	
Thunder Bay	158,698		2		31		1	2
Timiskaming	37,721							
Total - Northern	800,252		13	147	90		3	6
Eastern Ontario	194,945		4		3			1
Hastings & Prince Edward	159,088		4					
Kingston, Frontenac & Lennox	180,225				25		1	1
Leeds, Grenville & Lanark	163,143		1				1	
Ottawa	779,274		19	86	73		2	10
Renfrew	101,131		1		5			
Total - Eastern	1,577,806		29	86	106		4	12
Durham	512,271		11		60	5		4
Haliburton-Kawartha	168,120		6		4		1	
Muskoka-Parry Sound	86,218			36	1	1		
Peel	1,008,163		17	70	58	6	2	9
Peterborough	128,881		2		23			
Simcoe	377,405		11	123	19	4		3
Toronto - total	2,542,844	1	153	158	456	5	2	127
<i>North</i>	627,021		36	83	86	3		17
<i>South</i>	688,584	1	64	29	164		1	61
<i>West</i>	509,302		38	15	139	1	1	26
<i>East</i>	717,937		15	31	67	1		23
York	724,969		15		22	3	1	1
Total - Central East	5,540,871	1	216	387	643	24	6	144
Grey Bruce	157,664		1	12	10			1
Elgin-St. Thomas	84,182		1	1	1	1		
Huron	61,097		3	34	1	1		
Chatham-Kent	112,897			1	10	2		2
Lambton	131,643							
Middlesex-London	412,976		5		7			
Oxford	102,561		1			2		
Perth	75,238		4	3	2	3		
Windsor-Essex	381,672	1	5		47	1		3
Total - Southwest	1,519,930	1	20	61	78	10		6
Brant	126,481		2	5	25		1	1
Haldimand-Norfolk	109,536		1	72	7		1	
Halton	375,705		7	13	1		1	1
Hamilton	498,553		7	7	71	5	3	7
Niagara	423,600		12	66	18	2		6
Waterloo	446,833		4	7	53	3	1	2
Wellington-Dufferin-Guelph	241,777		8		16			
Total - Central West	2,222,485		41	170	191	10	7	17
November 2001	11,669,344	2	318	841	1,108	44	20	185
* Total YTD 2001	-	74	4,408	9,946	14,474	475	286	2,603
* Total YTD 2000	-	103	3,868	24,641	12,303	396	264	2,029

The Toronto City regions above are now defined as: North - former North York; South - former City of Toronto; West - former Etobicoke and City of York; East - former Scarborough and East York

* Adjusted for deletions and late reports.

Summary of Reportable Diseases in November, 2001

Health Units by Region	Population 2000	PPH3	Hepatitis A	Hepatitis B	Hepatitis C	Hib	Influenza	Measles	Meningococcal
Algoma	125,109				5				
North Bay	93,505			3	1				
Northwestern	91,920				1				
Porcupine	93,680				1				
Sudbury	199,619				7				1
Thunder Bay	158,698				4				
Timiskaming	37,721								
Total - Northern	800,252			3	19				1
Eastern Ontario	194,945								
Hastings & Prince Edward	159,088				1				
Kingston, Frontenac & Lennox	180,225				6				
Leeds, Grenville & Lanark	163,143								
Ottawa	779,274		1		44				
Renfrew	101,131				3				
Total - Eastern	1,577,806		1		54				
Durham	512,271								2
Haliburton-Kawartha	168,120			2	10				
Muskoka-Parry Sound	86,218								
Peel	1,008,163		1		17				
Peterborough	128,881				9				
Simcoe	377,405				22				
Toronto - total	2,542,844	10	1	9	132				
North	627,021	2	1	3	35				
South	688,584	8		5	46				
West	509,302				30				
East	717,937			1	21				
York	724,969	1			4				1
Total - Central East	5,540,871	11	2	11	194				3
Grey Bruce	157,664				4				
Elgin-St. Thomas	84,182								
Huron	61,097				1				
Chatham-Kent	112,897				2				
Lambton	131,643								
Middlesex-London	412,976				1				
Oxford	102,561								
Perth	75,238				1				
Windsor-Essex	381,672								
Total - Southwest	1,519,830				9				
Brant	126,481								
Haldimand-Norfolk	109,536				1				
Halton	375,705		1		2				1
Hamilton	498,553	1	1		23				
Niagara	423,600	1		2	22				
Waterloo	446,833				17				
Wellington-Dufferin-Guelph	241,777		1		1				
Total - Central West	2,222,485	2	3	2	66				1
November 2001	11,669,344	13	6	16	342				6
Total YTD 2001	-	179	158	160	4,781	6	760	6	102
Total YTD 2000	-	189	239	128	6,046	4	2425	2	76

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* Adjusted for deletions and late reports.

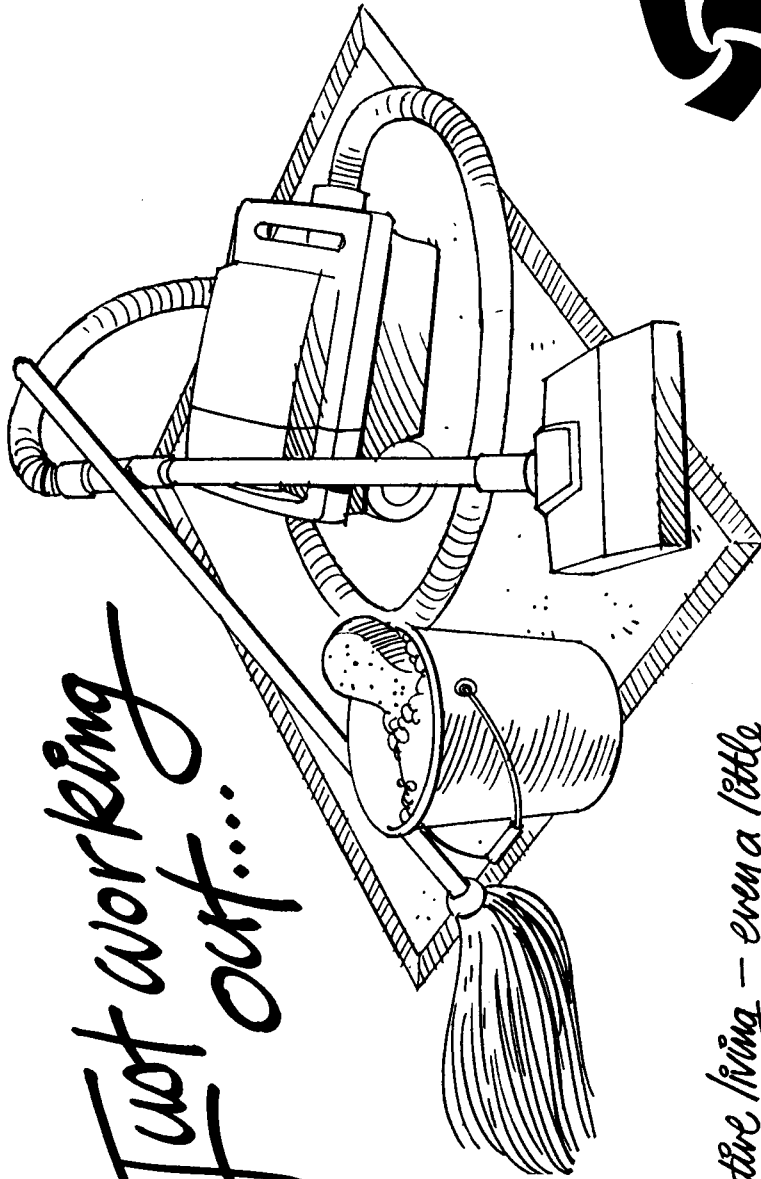
Summary of Reportable Diseases in November, 2001

Health Units by Region	Population 2000	Mumps	Pertussis	Rubella	Salmon.	Shigellosis	Syphilis (Prim/Sec)	VTEC
Algoma	125,109		1					
North Bay	93,505							
Northwestern	91,920				2			
Porcupine	93,680							
Sudbury	199,619							1
Thunder Bay	158,698		2		2			
Timiskaming	37,721							
Total - Northern	800,252		3		4			1
Eastern Ontario	194,945		1		1			
Hastings & Prince Edward	159,088		1		1			
Kingston, Frontenac & Lennox	180,225		2					
Leeds, Grenville & Lanark	163,143							
Ottawa	779,274		4		8	3		3
Renfrew	101,131		1		2			2
Total - Eastern	1,577,806		9		12	3		6
Durham	512,271		2		6			
Haliburton-Kawartha	168,120				3			
Muskoka-Parry Sound	86,218				1			
Peel	1,008,163		1		1			
Peterborough	128,881		2		5			
Simcoe	377,405				1			2
Toronto - total	2,542,844		4		55	5	1	7
<i>North</i>	627,021		2		7	1		
<i>South</i>	688,584		1		12	2	1	4
<i>West</i>	509,302		1		16	2		1
<i>East</i>	717,937				20			2
York	724,969		1		5			1
Total - Central East	5,540,871		10		77	5	1	10
Grey Bruce	157,664	1						
Elgin-St. Thomas	84,182				1			
Huron	61,097				1			
Chatham-Kent	112,897	1			2			1
Lambton	131,643							
Middlesex-London	412,976				2			2
Oxford	102,561				1			
Perth	75,238				1			
Windsor-Essex	381,672	1			8			1
Total - Southwest	1,519,930	2	1		16			4
Brant	126,481							
Haldimand-Norfolk	109,536				2			
Halton	375,705		1		5	1		
Hamilton	498,553		1		10	1		
Niagara	423,600				6	2		
Waterloo	446,833				3			
Wellington-Dufferin-Guelph	241,777				2			
Total - Central West	2,222,485		2		28	4		
November 2001	11,669,344	2	25		137	12	1	20
* Total YTD 2001		13	412	15	2,265	194	15	299
* Total YTD 2000		39	1,143	3	2,187	255	25	359

The Toronto City regions above are now defined as: North - former North York; South - former City of Toronto;
West - former Etobicoke and City of York; East - former Scarborough and East York

* Adjusted for deletions and late reports.

*Just working
F out...*



*...active living – even a little
regular physical activity makes
a healthy difference!*

